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## CONTENTS

EDITORIAL .....	119
LEVEL OF ASPIRATION AS A CASE OF JUDGMENTAL ACTIVITY IN WHICH EGO-INVOLVEMENTS OPERATE AS FACTORS—O. J. Harvey and Muzafer Sherif .....	121
THE USE OF A SOCIOMETRIC TEST AS A PREDICTOR OF COMBAT UNIT EFFECTIVENESS—Daniel M. Goodacre .....	148
AN EMPIRICAL VALIDATION OF A RIGIDITY SCALE AGAINST A CRITERION OF RIGIDITY IN AN INTERPERSONAL SITUATION —Stanley Moldawsky .....	153
A STUDY OF VALIDITY AND CONSTANCY OF SCORES IN A SOCIOMETRIC TEST—Eugene Byrd .....	175
A COMPARATIVE SOCIAL CLASS ANALYSIS OF SAN JUAN SUR, AND ATTIRO, COSTA RICA—Reed M. Powell .....	182
DEMOCRATIC METHODOLOGY IN PHYSICAL EDUCATION, A SOCIOMETRIC STUDY—Frances E. Todd .....	203
INJURY-PRONENESS AND ADJUSTMENT IN A SECOND GRADE— Elizabeth M. Fuller and Helen B. Baune .....	210
AN ANALYSIS OF SOCIAL REJECTION IN A COLLEGE MEN'S RESIDENCE HALL—John W. Kidd .....	226
A NOTE ON THE USE OF TARGET SOCIOGRAMS—Mary L. Northway ...	235
SOCIOMATRICES AND LEVELS OF INTERACTION FOR DEALING WITH PLURELS, GROUPS AND ORGANIZATION—Stuart Carter Dodd ....	237
LEOPOLD VON WIESE CELEBRATES HIS 75TH BIRTHDAY .....	249
RESEARCH PROGRAM, 1951-1952, LABORATOIRE DE SOCIOMETRIE ET D'EXPERIMENTATION PSYCHO-SOCIOLOGIQUES, SORBONNE .....	250
ANNOUNCEMENTS .....	252

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#### EDITORIAL

We are glad to announce that beginning with Volume XV *SOCIOMETRY* will appear promptly as scheduled—February, May, August and November.

We hope that this will satisfy the repeated requests of readers of the journal the world over.

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# LEVEL OF ASPIRATION AS A CASE OF JUDGMENTAL ACTIVITY IN WHICH EGO-INVOLVEMENTS OPERATE AS FACTORS\*

*An experimental Study of Interpersonal Relations\*\**

O. J. HARVEY AND MUZAHER SHERIF

*University of Oklahoma*

## *Introduction*

When research areas developing more or less separately are brought together in a functional way, the findings and theory of both gain. In the present study, the level of aspiration is conceived as but one instance of judgmental activity in which affective factors enter into the determination of response. Since judgment, ego-involvement, level of aspiration are more frequently found apart than together, a brief statement of the general conceptual scheme may be in order.

The experimental investigation of judgmental activity, or discrimination, is one of the more elaborated areas in psychology. In reviewing the work on psychophysical, affective, social, and personal judgments, McGarvey (12) concluded "that certain fundamental processes and principles of judgment may be assumed to be independent of the type of stimulus-material and of the dimension in which the judgment is rendered." (p. 79).

One of these general findings concerning judgmental activities is their referential nature. Chapman and Volkman (1) called attention to this "general fact that all judgmental activities take place within . . . referential frameworks" (p. 225), in harmony with Sherif's earlier conclusion (19, pp. 34-35). In judging physical stimuli, such as weights or lines, judgment is usually made in reference to certain anchoring points or reference points in the stimulus series (21). For example, these reference points may be introduced by the experimenter as a "standard" or comparison stimulus; or they may be the end points within (and, within limits, outside) the physical scale itself, etc. In judgments of social stimuli, the situation is complicated by a multiplicity of factors. Many of these factors are

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\* The units of work reported here were carried out under a contract between the Office of Naval Research and the Research Institute of the University of Oklahoma. All experimental work in this report was carried out between November 1950-April 1951 by O. J. Harvey. The authors are grateful to the following persons, as well as to ONR, for making this study possible: Dean Laurence H. Snyder, Verne H. Schnee and Dr. Lloyd E. Swearingen of the Research Institute.

\*\* The logical next step in our work along these lines is to link this experimental approach to interpersonal relations and to sociometric indices. Already some units of work are under way.

internal or *internalized*, i.e., they are intervening variables. Physiological needs of the organism, emotional states, social attitudes are examples of such internal or, as in the case of social attitudes or motives, *internalized* factors. (Of course, even in judging weights, the standards established by past experience as, say, a weight lifter or college professor must also be taken into account in the total picture.)

In judgmental and perceptual situations in which factors both internal and external to the individual enter in a complicated way to determine response, analysis is more adequate in terms of an entire *frame of reference* in which various factors, external and internal, carry differing weights in the resultant reaction (19). Within this frame of reference, certain factors will have more weight or be more salient than others in different situations.

The concept of *frame of reference*, which is used simply to denote this functional interrelatedness of factors internal and external to the individual determining reaction at a given time, is not specific to judgmental activities. The bulk of evidence in the study of perception, judgment, memory, attitudes, ego-involvements and a variety of social behavior clearly indicates its general utility in the study of human behavior (19, 20).

In different situations, the relative contribution of the external factors and internal factors varies. It is known that the relative prominence of external and internal factors varies with the degree of *structure* of the external stimulus situation. For example, in the autokinetic situation used by Sherif (18) to study these and related problems, the individual faces a tiny pinpoint of light in a completely dark room. In such *unstructured* situations, factors coming from the individual dominate the frame of reference within limits. The studies of Luchins (8, 9), Murphy and his students (6, 15) are among the pioneer studies in this area. The various "projective" tests, such as the Rorschach ink blot test, take advantage of such unstructured situations to study the effects of internal factors.

On the other hand, a graded scale of weights, or lines, or tones has more definite objective structure. When the individual faces such structured situations, internal factors carry relatively less weight in the reference frame, while the physical characteristics of the stimulus situation predominate. A more or less normal adult cannot ignore the compelling structure of the Empire State Building or Rockefeller Center.

One of the psychologist's principal tasks is to envision and conduct experiments, varying the stimulus situation and this factor then, that one later, to determine the relative weights of internal and external factors which are functionally interrelated at a given time in the structuring of experience



and hence, response. The present investigation was conceived as another unit carried out within this conceptual scheme.

In daily social life, it is well known that our judgments are influenced by our relationships with other persons, groups, institutions and the like. It is a common human experience that we tend to overestimate the potentialities and actual accomplishments of those high in our esteem, and tend to minimize the potentialities and accomplishments of our rivals, competitors, and enemies.

The effects of ego-involvements as dominant factors in the frame of reference may be illustrated by investigations of judgment. In an early study (1915), Cogan, Conklin and Hollingworth (2) found overestimates and underestimates in self-ratings according to the desirability of the "trait" in question. Marks' well-known study of judgments of skin color by Negro subjects (10) revealed that the subject's relation to the desired norm of light brown more or less determined the scale he established in judging other people's coloring.

Chapman and Volkmann (1) explicitly brought research on level of aspiration into functional relation with judgment: "The conditions which govern the setting of a level of aspiration (*Anspruchs-niveau*), in the sense of an estimate of one's future performance in a given task, may be regarded as a special case of the effect upon a judgment of the frame of reference within which it is executed." (p. 225) In their study, experimentally introduced anchorage points (scores on the task purportedly made by literary critics and W. P. A. workers) effectively lowered or raised the aspiration level. Several investigators confirmed their findings concerning the effect of "superior" and "inferior" standards upon estimate of future performance. (For example, Festinger (3), Preston and Bayton (14), and MacIntosh (11).)

This same conception of level of aspiration as an instance of the effect of the frame of reference within which judgment is executed guided Sears' study of academically successful and unsuccessful school children. In this case, the children's estimates of their future performance were made in terms of internalized "cultural pressure to excell and to keep the performance improving" and the child's awareness "of the position of the self relative to social norms" for performance (16, p. 528).

In a more recent study by Himmelweit in England (5), using neurotic patients in a hospital, it was noted that "In the case of the anxious and the depressed patient, no outside group norm is imposed—it is rather an interiorized one, based upon the conception that the patient has of his ability in

relation to those of the group. Since he considers himself inferior . . . he behaves as if his performance had been compared with that of a superior group." (p. 57)

The general fact stated above that all judgments, including estimate of one's own performance, are made within referential frameworks was clearly substantiated in a review of the "level of aspiration" studies in 1944 by Lewin, Dembo, Festinger and Sears (7). In accord with the earlier formulations of Chapman and Volkmann and of Sears, the authors conclude that such influences as temporary situational factors, standards on one's own and other groups, etc., upon the setting of an aspiration level "may be conceived of as frames, involving a scale of values, within which the individual makes his decision as to a goal." (p. 57)

The studies summarized here, representative of a body of experiments, indicate that ego-involvements may enter the total frame of reference as dominant factors in judgmental activity, whether it involves a specific stimulus situation with social value or a future situation, as in the aspiration level studies. When judgmental activity is so viewed as taking place within a frame of reference involving both external and internal factors, demarcations between "fact" judgments and "value" judgments (or between the affective and cognitive) fade away. We may speak rather, of *various degrees and kinds of internal factors (e.g., needs, ego-involvements, etc.) and of external factors (the concrete stimulus situation, presence of other persons, etc.) operating in the judgmental situation.*

### *The Problem*

In everyday life relationships, people are seldom impartial in their judgments and expectations of the activities of others, especially if the individuals stand in some more or less established relationship (positive or negative) to one another. This common observation has been neatly demonstrated in a laboratory situation by Zeaman (22). In the autokinetic situation, a naive subject made judgments of the distance of apparent movement, first with a person for whom he felt a good deal of affection and later with a person toward whom he tended to be antagonistic. The finding was that the naive subject's judgments tended to converge toward those of the person of whom he was fond and to shift away from those of the person toward whom he was antagonistic. Thus, the *direction* of ego-involvement (positive or negative) determined the course of the judgments.

McGehee (13) compared individual's judgment of their own future performance and their judgments of another person's future performance in

a simple dart throwing situation. Subjects were paired, no point being made of the relationship between subjects of the pairs. In this situation, he concluded that the subjects were more ego-involved in estimating their own performance than in estimating the other person's. This differential ego-involvement was reflected in the two judging situations.

On the other hand, when individuals are positively involved with one another, no such differential trend in judgments is found. In C. Sherif's study (17)\*, subjects in a similar dart throwing situation were pairs of husbands and wives or of parents and children. Positively related to one another as relatives and loved ones, the subjects tended to be as ego-involved in their partner's performance as in their own. This ego-involvement was reflected in characteristically similar judgments of their own future performance and of their partner's (mate, parent, or child's) future performance. Discrepancy of judgment of future performance from actual performance scores and variability of judgments were highly similar (with no significant differences) for judgments of own performance and of the partner's performance. In some cases, the degree of involvement manifested was actually greater for the other person than for one's self. These findings were supported by the spontaneous remarks of encouragement and support made to the partners. In some cases these remarks were more tense and emotionally toned than remarks concerning own performance. Although no systematic attempt was made to determine the degree of positive involvement between the subjects, and hence differences from pair to pair were not individually analyzed, certain uniformities in the behavior of the various pairs were noted. In various degrees the husbands tended to be protective toward their wives, encouraging and comforting them. The wives, on the whole, tended to maintain an admiring role in relation to their husband's performance. Parents, paired with their children, manifested keen desire for their children's performance to be high and to improve; while the children seemed to expect good performance from parents and to be disappointed if they showed any weakness, even in dart throwing.

Thus, the discrepancy between judgment of another's future performance and erection of the aspiration level (judgment of own future performance) obtained by McGehee tended to disappear when positive ego-involvement between partners in the dart throwing situation was introduced. Commenting on this and other studies, Sherif (20) suggested that "further variations would be obtained if the subjects were involved with each other

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\* Read before the Eastern Psychological Association Meetings, April 26, 1947.

in a *negative* way, e.g., as bitter personal rivals, competitors, or members of antagonistic groups". (p. 292)

The present study, emanating from this suggestion, aims at extending the scope by investigating the effect of negative relationships as well as positive relationships in the estimation of own future performance and of another's future performance. In addition, different degrees of positive involvement were introduced. In brief, pairs of individuals who are definitely involved with one another in a negative way (antagonistic or competitive), pairs strongly involved in a positive way (sweethearts), and pairs who were merely friends were placed in a dart throwing situation, ostensibly a "test of eye-hand coordination." Each subject estimated his own future performance and also that of his partner in the task.

The hypotheses to be tested were:

1. When individuals are strongly ego-involved with one another in a *positive* way, the discrepancies between performances and their estimates of *each other's future performances* will not differ significantly. Further, the discrepancies between performances and estimates of *their own* and of *their partner's future performance* will not differ significantly.

2. When individuals are strongly ego-involved with one another in a *negative* way, the discrepancies between performances and their estimates of *each other's future performance* will differ significantly. Further, the discrepancies between performances and estimates of *their own* and of *their partner's future performance* will differ significantly.

3. When individuals are mildly ego-involved with one another (such as friends who are not strongly committed to one another) differences will be found in the discrepancies between performances and estimates of *each other's future performance*. Further, differences will be found in discrepancies between performances and estimates of *their own* and of *their partner's future performance*. These differences should not be as great or as significant as those found for negatively involved pairs of subjects.

### Subjects

Four groups of subjects, totalling 140, were used. The subjects were high school and college students. All subjects were paid at the rate of 60 cents an hour for participation in the experiment.

The four groups of subjects were:

1. *Coll. ps*: pairs of college students positively (p) ego-involved with one another as sweethearts (S). There were 20 pairs of male-female combinations. The criteria of selection were that the subjects be engaged to be married or be married for less than 8 months.

2. *H.S. ps*: pairs of high school students positively (p) ego-involved with one another as "steadies" (S). Twenty pairs of male-female combinations were selected who were known by teachers, counselors and friends to be "going steady."

3. *H.S. pf*: pairs of high school students positively involved (p) as friends (f). Ten pairs of subjects (7 male and 3 female) were selected as friends on the basis of their constant companionship in and out of school and their special attempts to have classes together in a large high school.

4. *H.S. n*: pairs of high school students who were strongly and *negatively* (n) ego-involved. Twenty pairs of subjects, (17 male and 3 female) were selected who had recently fought with each other, attempted to fight but were restrained, or who were competing for the same boy or girl friend.

All cases from the high school were ones known to their teachers and counselors.

It would have been desirable from the point of view of precision, to obtain subjects who were negatively involved along the same dimension as the positively involved groups, but in a different direction. This was not possible. Nor was it found possible, in spite of extensive efforts, to secure a sufficient number of college subjects who could meet the criteria defining a strongly negative relationship.

### *Apparatus*

The apparatus consisted of a specially constructed dart board, 5 feathered darts, mimeographed score sheets and questionnaires.

The dart board was 36 by 44 inches surrounded by an 8 inch border of gray plywood. A piece of unbleached muslin containing 10 concentric circles ranging in score value from 2 (the outside circle) through 4, 6, 8, etc., to 20 (the bull's eye) was tightly stretched on a detachable frame. This target was removable. Behind it, was a second target of unbleached muslin which was blank with the exception of a dot in the center. This blank target was stretched across a beaverboard back. Darts were actually thrown at this blank target in an attempt to provide a stimulus situation with as little objective structure as possible. (See discussion of results on this point.) On the back side of the dart board, visible only to the experimenter, was a target containing concentric circles and appropriate score values so that as the dart pierced the beaverboard, the experimenter could record the scores out of the subject's sight. In addition, this hidden target shielded the experimenter as he recorded the relevant spontaneous remarks of the subjects in the experimental situation.



The use of the removable target with scored concentric circles will be specified below (Procedure).

### *Procedure*

All subjects were tested in pairs with only the experimenter present. High school subjects were tested at Capitol Hill Senior High School, Oklahoma City and college subjects in an experimental room on South Campus, the University of Oklahoma. Each pair participated in one experimental session lasting approximately an hour. They were instructed that the study concerned eye-hand coordination. The validity of this explanation was not questioned. Its acceptance is indicated by statements on the questionnaires and oral remarks, such as "My hand and eye coordination is very poor," "My hand and eye coordination is better than I expected."

In order to insure interest in the task, the subjects were told that the results revealed certain characteristics of their personalities, as well. This remark was introduced *after pre-tests* indicated that some subjects, especially on the college level, were not sufficiently challenged by the dart throwing itself.

Subjects were shown the removable target marked with score values to acquaint them with the basis of scoring. Darts were actually thrown at the blank target, and estimates made on this basis. One thrown dart constituted a trial. This was chosen as a more sensitive method of scoring than the total of several darts used by previous experimenters.

Subjects were instructed as follows:

This is an experiment aimed at testing your hand and eye coordination, that is, it will attempt to measure how closely you can coordinate the motor skill of dart throwing with visual skill in two situations: in estimating the performance of yourself and in estimating the performance of another. The results of this test will reveal certain aspects of your personality so it is important that you do your best on it.

You will notice at the front of the room a target containing ten concentric circles ranging in numerical score value in series of two's from two to 20. The worst score you can make, of course, is zero and the best possible score is 20. Look carefully at the target containing these concentric circles and score values and remember their order because you will not throw at this target. It will be removed and you will throw at a target of the same size but without the circles and score values. (The removable target was detached, revealing the blank target.)

After 10 practice trials, I want each of you to have 50 trials at the blank target. First, one of you will take your 60 trials, and then the other. The one of you who is throwing will record before each trial

the score you actually expect to make on that trial and also announce it aloud. After you have thrown you will record and call aloud the score you think you actually made on the dart just thrown.

The one of you who is not throwing will record before each trial the score you expect the other will make on that particular trial. You will also record after each trial the score you think your partner actually made on the dart just thrown. You are not to call your estimates aloud. You are to make your estimates on this sheet before the one who is throwing announces his aloud. You may signify this by "O. K." (Blanks on the score sheet for recording estimates were indicated.)

I will not be able to tell you your score. However, I will remind you that 20 is the best possible score. If there are no further questions, I shall toss a coin to see which one of you throws first.

The subject thus selected to throw first was given 5 darts and the target with concentric circles removed from sight. Each subject threw from a line 15 feet from the target. The experimenter offered no suggestions on how to throw the darts. He stood behind the dart board, recording the scores and spontaneous remarks of the subjects without comment.

After 10 practice trials and 50 test trials, the subject throwing (Bidder) became the observer (Estimator) while the second subject, who had been observing, began to throw. Each subject (as Bidder) thus estimated his own future score on each trial and the score he believed he actually made. As Estimator, each subject estimated his partner's future score on each trial and the score he believed his partner actually made on each trial. Consequently, the data for each subject consisted of 100 judgments related to his own performance (before and after each trial) and 100 judgments related to his partner's performance (before and after each trial). The procedure followed for both subjects of the pair was the same.

In this dart throwing situation, the task was such that actual performance is readily perceived visually by the subject. The formal announcement of performance to the subject by the experimenter amounts, in this situation, to repeating to the subject what is already obvious to him. Announcement of the obvious to the subject in this case would serve merely to clutter the experimental situation unnecessarily. Therefore, in the present procedure, it was deemed unnecessary and unnatural to make an announcement of performance to the subjects. In preliminary work, comparison of subjects' own estimates of performance which they recorded after each trial with the experimenter's record of actual score revealed inappreciable differences (indicating that the removal of the structured target with scored concentric circles did not produce a sufficient degree of unstructuredness).

As supplementary material, a questionnaire was administered *after* the

session was completed. The questions concerned their degree of certainty as to their estimates, the difficulty of estimating, their feelings when they and their partner made scores higher and lower than estimated, and general impressions of the session.

### Results

To test our hypotheses, the main task in the analysis of data becomes comparison of judgments made by the subjects, standing in the different relationships specified before, in the Bidder and Estimator roles of the experimental situation. The data were analyzed by comparison of discrepancy scores (D scores). The D score is the difference between estimate and performance. Since in the procedure used the actual performance scores were not announced to the subjects for reasons mentioned previously, their estimates of actual performance *after* each trial were used rather than the score recorded by the experimenter. Thus, performance scores used in the computation of D scores were those perceived and recorded by the subjects themselves. As mentioned before, preliminary work indicated that in this simple situation with one dart constituting a trial, relatively inappreciable differences were found between actual performance and perception of actual performance.

The first comparison of discrepancy scores concerns the relative accuracy of estimation. D scores—the difference between estimates of future performance and subsequent estimates of the actual performance—were computed for every trial. In this case, the comparison made was between D scores of the two paired subjects on the same series of trials—one subject serving as Bidder and estimating his own performance while his partner served as Estimator, estimating the Bidder's performance. The means of these D scores for the Bidder and for the Estimator were obtained. The difference between the average D scores of the two paired subjects, Bidder and Estimator, was computed as follows:  $\text{Mean } D_{B1} - \text{Mean } D_{E2}$ . Here  $D_B$  refers to the Bidder's discrepancy scores,  $D_E$  to the Estimator's discrepancy scores, the subscripts 1 and 2 merely indicating that in this analysis the Bidder and Estimator were the *two different* subjects in each pair, both estimating at the same time the future performance and actual performance of the Bidder.

Table I gives frequency of distributions of the differences in accuracy ( $\text{Mean } D_{B1} - \text{Mean } D_{E2}$ ) between the Bidders and Estimators. Negative values in the table mean that the Estimator overestimated the Bidder's future performance to a greater extent than did the Bidder himself. Data are presented for subjects in the 4 experimental groups—college sweethearts



(Coll. ps), high school "steadies" (H.S. ps), high school friends (H.S. pf), and high school students negatively involved as rivals (H.S. n) (*See Subjects*). It is seen in Table I that for the most positively involved groups of subject-pairs (Coll. ps and H.S. ps), the differences between Bidder and Estimator in mean D scores cluster around zero, about 66% of cases being within 1.49 on either side of the zero point. In contrast, most of the cases (85%) in the group of rivals (H.S. n) pile up between 1.5—4.49 on the positive side of zero. These findings are perhaps all the more significant when it is considered that some competition enters into this experimental situation almost unavoidably (*See Discussion of Results*).

TABLE I  
FREQUENCY DISTRIBUTION OF DIFFERENCES IN MEAN D SCORES (ACCURACY) FOR  
ESTIMATING ONE'S OWN FUTURE PERFORMANCE AND FOR ANOTHER  
PERSON'S ESTIMATE OF ONE'S FUTURE PERFORMANCE

Difference	Mean $D_{B1}$ —Mean $D_{E2}$			
	Group Coll. ps N = 40	Group H.S. ps N = 40	Group H.S. pf N = 20	Group H.S. n N = 40
6.00 - 7.49	—	—	—	1
4.50 - 5.99	—	—	—	2
3.00 - 4.49	1	3	—	18
1.50 - 2.99	8	8	5	16
0 - 1.49	16	13	12	3
0 - -1.49	12	12	2	—
-1.50 - -2.99	2	3	1	—
-3.00 - -4.49	1	—	—	—
-4.50 - -5.99	—	1	—	—
-6.00 - -7.49	—	—	—	—

Table II presents the means of these differences in discrepancy scores for Bidder and Estimator and the statistical significance of this mean difference for each group of subjects.

As Table II indicates, the mean difference in accuracy (D scores) of the Bidder (estimating his own future performance) and of his partner (estimating the Bidder's future performance) is small and not significant statistically for each of the positively involved groups of subjects. For subjects most strongly involved in positive relationships, college sweethearts and high school "steadies", these mean differences are .304 and .459, respectively. For the less positively involved subjects, high school friends, the difference in means is .894. Since none of these differences is significantly

different, we may say that the relative accuracy of the aspiration level (estimates of own future performance) and another person's estimate of that future performance for subjects who are positively ego-involved with one another is similar. It is noted that the least involved of these three groups of subjects with positive relationships (friends) had relatively a much larger mean difference in accuracy scores (.894).

TABLE II  
DIFFERENCES BETWEEN MEAN ACCURACY SCORES FOR THE FOUR EXPERIMENTAL GROUPS  
AND THEIR SIGNIFICANCE  
Differences in accuracy of estimating one's future performance and of another's  
estimate of this performance.

Mean diff.	Mean difference = Mean $D_{B1}$ — Mean $D_{E2}$			
	Group Coll. ps	Group H.S. ps	Group H.S. pf	Group H.S. n
	.304	.459	.894	3.075
t	1.394	1.633	1.337	17.083
P	>.10	>.10	>.10	<.01

In contrast, the mean difference in accuracy for the negatively involved group of high school students (H. S. n) is 3.075 which is significant at less than the .01 level. This means that on the average the difference between estimate of future performance and estimate of actual performance was significantly greater for the Bidder than for the Estimator, when the two were negatively involved with each other.

This significant difference between accuracy of estimating one's own future performance and accuracy of a negatively involved partner's estimate of this future performance is one of the striking findings of this study, especially when compared with the mean difference in accuracy of Bidder and Estimator in the positively related groups. The obtained mean difference in D scores for negatively involved subjects (3.075) is almost seven times greater than the mean difference in D scores for Group H. S. ps (.459) and ten times greater than for Group Coll. ps (.304). The actual difference between the means of Coll. ps and H. S. n and between H. S. ps and H. S. n are 2.77 and 2.62, respectively.

Testing the significance of the above differences, we find the following: When Group Coll. ps is compared with Group H. S. n, the obtained difference is significant at less than .01 level,  $t = 9.75$ . Comparing Group H. S. ps and Group H. S. n, the obtained difference is likewise significant at less than .01 level,  $t = 7.76$ . Thus it can be concluded that the difference between

D scores of the Bidder and Estimator when the relationship between them is strongly positive is significantly less than the difference between D scores of the Bidder and Estimator when their relationship is negative.

The hypotheses to be tested require that comparison also be made between the accuracy of each subject's judgment as Bidder, estimating *his own* future performance, and as Estimator, estimating *his partner's* future performance. In this case, comparisons made between the mean D scores of each subject when he was Bidder and when he was Estimator. The difference between average D scores was computed as follows:

$$\text{Mean } D_{B1} - \text{Mean } D_{E1}$$

the subscript 1 indicating that in this analysis the *same* subject's D scores as Bidder (indicated by subscript B) and as Estimator (indicated by subscript E) of his partner's performance were compared.

TABLE III  
FREQUENCY DISTRIBUTION OF DIFFERENCES IN MEAN D SCORES (ACCURACY) OF  
ESTIMATING ONE'S OWN FUTURE PERFORMANCE AND ESTIMATING  
A PARTNER'S FUTURE PERFORMANCE

Difference	Mean $D_{B1} - \text{Mean } D_{E1}$			
	Groups			
	Coll. ps N = 40	H.S. ps N = 40	H.S. pf N = 20	H.S. n N = 40
7.50 - 8.99	—	—	—	2
6.00 - 7.49	—	—	—	2
4.50 - 5.99	—	1	—	4
3.00 - 4.49	2	1	3	11
1.50 - 2.99	5	11	4	14
0 - 1.49	19	14	6	3
0 - -1.49	8	6	6	3
-1.50 - -2.99	5	5	1	1
-3.00 - -4.49	1	—	—	—
-4.50 - -5.99	—	—	—	—
-6.00 - -7.49	—	2	—	—

Again, as shown in Table III, a frequency distribution of these mean D scores was made. In this comparison between one subject estimating his own future performance and estimating his partner's future performance, the majority of the subjects in the two most positively involved groups (Coll. ps and H. S. ps) again clusters around zero, while subjects of the rival pairs (H. S. n) pile up between 1.50—4.49 on the plus side. However, there are

four subjects in the negatively involved group (H. S. n) constituting an exception to this tendency, inasmuch as the mean difference in D scores was negative (i.e., D score was larger when subject was in the Estimator role). These 4 subjects seemed characteristically to set low aspiration levels which coincided closely with actually obtained scores. A plausible explanation in this few atypical cases, in contrast to greater inaccuracy in judging the partner's future performance, seems to lie in the possibility of protecting the self in the presence of a hostile rival by hitting the nail on the head in relation to one's own capabilities as much as possible. While most subjects in these groups tended to keep the aspiration level high, these subjects for various reasons did not care to expose themselves to possible ridicule by allowing large discrepancies to appear between performance and aspiration level. The problem which this touches upon relates to individual techniques of maintaining self satisfaction or stability. This is not the topic of the present investigation. However, the specific relationship between the pair to which one of these four subjects belonged illustrates the point. The subject was an undergrown boy who had recently fought his partner. Investigation revealed that he was afraid of his larger partner and, at the time of the experiment, was making peaceful overtures to him in spite of their reciprocal antagonism and violent dislike for one another. As a result, he kept his own aspiration level within safe and easy range of his performance, while greatly overestimating the future performance of his stronger and feared partner in the experiment.

Table IV gives the mean of these differences in discrepancy scores for the same subjects serving as Bidder and as Estimator and the statistical significance of the mean differences for each group of subjects. Table IV shows that the difference in average D scores for the subjects in the two most positively involved groups in estimating their own future performance (aspiration level) and, when they changed to the Estimator role, estimating their partner's future performance are small. These differences for college sweethearts and high school "steadies" are .395 and .413, respectively. Neither difference is statistically significant. In this comparison, between each subject's estimate of his own future performance and of his partner's future performance, a larger and statistically significant difference between D scores for the less positively involved group of high school friends was found, namely .945. This is in harmony with the direction of difference found in Table II.

Again, by far the largest and most significant difference was found between the D scores of subjects estimating their own future performance and

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TABLE IV

DIFFERENCES BETWEEN MEAN ACCURACY SCORES FOR THE FOUR EXPERIMENTAL GROUPS  
AND THEIR SIGNIFICANCE

Differences in accuracy of estimate of one's own future performance and of one's estimate  
of another's future performance.

	Mean difference = Mean $D_{B1}$ - Mean $D_{E1}$			
	Group Coll. ps	Group H.S. ps	Group H.S. pf	Group H.S. n
Mean diff.	.395	.413	.945	3.076
t	1.466	1.105	3.975	8.839
P	>.10	>.10	<.01	<.01

estimating the future performance of a partner toward whom they were antagonistic. For the negatively involved group of high school subjects, the mean difference was 3.076, significant at less than .01 level.

This difference in accuracy of estimating one's own future performance and in estimating the future performance of a partner with whom one is negatively involved (3.076) is strikingly greater than the mean difference in D scores for Group Coll. ps (.395) and Group H. S. ps (.413). The actual difference between the means of Coll. ps and H. S. n is 2.681 and that between H. S. ps and H. S. n is 2.66.

The significance of the above differences was tested. When Group Coll. ps was compared to Group H. S. n, the difference was significant at less than .01 level,  $t = 6.168$ . Comparing Group H. S. ps to Group H. S. n, the obtained difference was significant at less than .01 level,  $t = 5.27$ . Thus, the difference between D scores for a subject as Bidder and for the *same subject* in the changed role of Estimator was found to be significantly less when the subject pairs were positively involved than when they were negatively involved with one another.

The second set of comparisons of discrepancy scores related to the *consistency* of judgment. The problem in this analysis was the effect of actual performance, as estimated by the subjects, upon the subsequent judgment of the subject's own future performance and partner's judgment of his future performance. Frank (4) mentioned the "rigidity" of the aspiration level, i.e., its consistency in spite of variation in performance.

The consistency score was obtained for each trial by subtracting from each estimate of future performance the score the subject perceived as made on the immediately preceding trial. We can conveniently designate estimate of future performance (aspiration level) on the  $k$ th trial by  $A_K$  and the

estimate of actual performance on the  $k$ th trial by  $P_k$ . Accordingly, the consistency score ( $C$ ) is the difference between estimate of future performance on the  $k$ th trial and estimate of actual performance on the  $(k-1)$ th trial, i.e.,

$$C = A_k - P_{k-1}$$

These consistency scores were computed for every subject as Bidder and as Estimator. The mean consistency scores of the two paired subjects were compared as follows:

$$\text{Mean } C_{B1} - \text{Mean } C_{E2}$$

$C$  refers to consistency score,  $B$  to Bidder,  $E$  to Estimator, and the subscripts 1 and 2 to the fact that comparison here is made between the two *different* subjects of a pair, one serving as Bidder and one as Estimator.

TABLE V  
DIFFERENCES BETWEEN MEAN CONSISTENCY SCORES FOR FOUR EXPERIMENTAL GROUPS  
AND THEIR SIGNIFICANCE

Differences in consistency of estimating one's own future performance and of another's estimate of this performance in terms of prior judgment of actual performance.

	Mean $C_{B1} - \text{Mean } C_{E2}$			
	Group Coll. ps	Group H.S. ps	Group H.S. pf	Group H.S. n
Mean diff.	.410	.372	.911	2.985
$t$	1.677	1.266	3.780	6.769
$P$	>.10	>.10	<.01	<.01

Table V gives the obtained mean differences in average consistency scores for Bidder and Estimator and the statistical significance of these differences. The differences of .410 and .372 found for college sweethearts and high school "steadies", which are not statistically significant, indicate that the effect of past performance on estimate of future performance for the most positively involved pairs of subjects tended to be similar in terms of this analysis.

For the least involved of the positively related group of pairs (high school friends) and especially for the negatively involved group of pairs (high school rivals), past performance had a significantly greater effect on the Estimator's judgments of his partner's future performance than on the Bidder's own judgments of his future performance. These differences of .911 for friends and 2.985 for rivals are both significant at less than the .01 level.

Consistency scores were then computed for each subject serving



successively in the session as Bidder and as Estimator. This time the comparison made was between the means of the consistency score for each subject when judging his own future performance and when judging his partner's future performance: Mean  $C_{B1}$ —Mean  $C_{E1}$ , the subscript 1 indicating that the comparison is between the *same* subject's judgments as Bidder (B) and as Estimator (E). The mean difference obtained in this way and the statistical significance of this difference is shown for each of the four experimental groups in Table VI.

The small mean differences obtained for the two most positively involved groups, .122 and .361, indicate that when an individual is strongly involved with his partner in a positive way, past performance exerts no significantly greater effect upon estimate of that person's future performance than upon the erection of an aspiration level for one's self.

If on the other hand, two individuals are merely friends or especially if they are actual enemies, the checking effect of past performance is greater when judging the other person's future performance than when estimating own future performance. The mean differences for the group of friends and for the group of rivals are .956 and 3.145, respectively, both being statistically significant.

The findings summarized statistically above, indicating similarities in judgments of partners of strongly and positively involved pairs, are substantiated by the analysis of material obtained by the questionnaire administered to the S's after the session was completed. Perhaps the most telling substantiation came from four questions concerning the subjects' feelings at

TABLE VI

DIFFERENCES BETWEEN MEAN CONSISTENCY SCORES FOR THE FOUR EXPERIMENTAL GROUPS AND THEIR SIGNIFICANCE

Differences in consistency of estimating one's own future performance and estimating a partner's future performance, in terms of prior judgment of actual performance.

	Mean $C_{B1}$ —Mean $C_{E1}$			
	Group Coll. ps	Group H.S. ps	Group H.S. pf	Group H.S. n
Mean diff.	.122	.361	.958	3.145
t	.455	.989	2.876	9.798
P	>.10	>.10	<.01	<.01

their own and their partner's successes and failures. These questions were as follows:

5. How did you feel when you made a score *higher* than you estimated?

6. How did you feel when your partner made a score *higher* than you estimated?
7. How did you feel when you made a score *lower* than you estimated?
8. How did you feel when your partner made a score *lower* than you estimated?

Subjects responded to these questions by checking one category on a 7 point scale ranging from "very pleased" to "very displeased", with "indifferent" in the middle category.

Table VII summarizes the answers to questions 5 and 6. About 93% of the most positively involved subjects (36 in Coll. ps and 38 in H. S. ps), indicated some degree of pleasure when either they or their partners made scores *higher* than estimated. In fact, slightly more subjects in both groups were more pleased at their partner's success than their own. The majority of friends (H. S. pf) were pleased at both their own and their partner's successes; but more subjects were "indifferent" toward their partner's successes than toward their own successes.

In contrast, all but one of the 40 negatively involved subjects were pleased with their own successes; but 26 (65%) were indifferent or displeased in some degree at their partner's successes.

TABLE VII  
COMPARISON OF EXPRESSED FEELINGS ACCOMPANYING ONE'S OWN AND ONE'S PARTNER'S SUCCESS: PERFORMANCE *Higher* THAN ESTIMATED

	Group Coll. ps N = 40		Group H.S. ps N = 40		Group H.S. pf N = 20		Group H.S. n N = 40	
	Self	Partner	Self	Partner	Self	Partner	Self	Partner
Very displeased	—	—	—	—	—	—	—	—
Displeased	—	—	—	—	—	—	—	4
Slightly displeased	—	—	—	—	—	—	—	5
Indifferent	4	4	2	3	1	7	1	17
Slightly pleased	8	6	10	3	4	4	13	10
Pleased	22	18	19	22	11	5	19	4
Very pleased	6	12	9	12	4	4	7	—

These findings concerning the subject's feelings of success are borne out by the responses to questions 6 and 7 concerning response to failure (Table VIII). About 87% of the most positively involved subjects (32 in Coll. ps and 37 in H. S. ps), were displeased when they or their partners made scores *lower* than they estimated, with none being pleased. In the negatively involved group (H. S. n), 26 subjects (65%) were indifferent or pleased in



TABLE VIII

COMPARISON OF EXPRESSED FEELINGS ACCOMPANYING ONE'S OWN AND ONE'S PARTNER'S FAILURE: PERFORMANCE *Lower* THAN ESTIMATED

	Group Coll. ps N = 40		Group H.S. ps N = 40		Group H.S. pf N = 20		Group H.S. n N = 40	
	Self	Partner	Self	Partner	Self	Partner	Self	Partner
Very displeased	2	—	3	1	2	1	6	—
Displeased	11	9	19	22	10	3	17	4
Slightly displeased	19	18	15	12	6	8	13	10
Indifferent	8	13	3	5	2	7	4	16
Slightly pleased	—	—	—	—	—	—	—	6
Pleased	—	—	—	—	—	1	—	4
Very pleased	—	—	—	—	—	—	—	—

some degree when their partners failed to achieve the score they estimated. But 36 of the 40 subjects in this group were displeased in some way at their *own* failures to achieve the estimated score.

*Spontaneous Reactions:* The spontaneous reactions of the subjects during the experimental sessions supply crucial verification of the statistical findings. In the most positively related groups, disappointment and elation at the partner's failures and successes were expressed frequently and exuberantly, as well at one's own successes and failures. Poor performance by a partner called for grunts, groans, shrieks, whistles, and a host of exclamations, such as "Goodness," "My heaven!" "Lordee!," etc.

Encouragement was frequently given to the subject throwing in these groups by their partners. For example, one girl told her boy friend: "Try to hit the jackpot for us this time." A boy said to his girl friend, who was throwing: "Get me a bull's eye." Success was greeted by such remarks as "That's fine!", "Good, good. You're getting good." Or, as one girl exclaimed when her boy friend made a consistently high score: "Goodness, you're as good as I think you are."

Subjects in these groups frequently instructed their partner who was throwing on how to improve his score. For example, a boy to his girl friend: "Throw from the wrist, honey. Don't hesitate to throw, now, for you make worse when you hesitate. And be sure to aim for where you call." Another boy: "A—, you're throwing too hard; not so hard." Still another male subject to his sweetheart after she made a series of low scores: "Honey, you're disappointing me. Now slow down; you can beat that."

Although subjects in all three of the positively related groups (Coll. ps, H. S. ps, and H. S. pf) expressed in varying degrees remarks of encouragement

to their partners and disappointment or elation at performance, this was most marked among college students. The relatively less spontaneity among high school subjects was due to the fact that they perceived the experiment more as a formal test than did the college students. This was indicated by their whole demeanor in the experimental situation and by their respectful treatment of the experimenter, whom they usually addressed as "Sir," responding to his instructions and questions with "Yes, Sir" and "No, Sir." The college students, on the other hand, saw the experimenter as one like themselves, and were much more informal.

This general concern in the positively related groups that one's partner's, as well as one's own performance meet one's expectations of success, was conspicuously lacking in the negatively involved subject pairs (H. S. n). Not only did the negatively involved subjects keep comment on their partner's performance to a minimum, these same subjects voiced only a few expressions of concern over their own success and failure. In the presence of an individual toward whom one is antagonistic, overt concern over performance was suppressed on the whole.

### *Discussion of Results*

The analysis of data in this experiment reveals the differential effects of varying one important factor in the frame of reference determining behavior. In the present instance, as internal factor—ego-involvement—was varied in direction and degree by placing in the same stimulus situation pairs of subjects with objectively differing personal relationships.

The selection of strongly and positively involved pairs was made from sweethearts, newlyweds, and "steadies" so that there would be great likelihood that the degree and direction of ego-involvement would follow that expected of their relationship. The friends were selected on the basis of actual behavior, rather than mere pencil and paper preferences. The negatively involved pairs had actually fought or been restrained from fighting one another or, in a few cases, were competing for the same goal. Nevertheless, no assumptions were made that there would be the same intense degree of positive involvement between pairs of "steadies" or newlyweds, or the same degree of reciprocal antagonism between partners in each of the negatively involved pairs. In fact, there might have been some cooling off or even friction between a few positively involved pairs, as results of a few atypical pairs would indicate. It would have been very desirable to make an intensive study of these few atypical positive pairs to ascertain whether or not, at the time of the experiment, some situation of friction existed between the members of

the pair. Nor is the assumption made that the positive or negative involvement between members of a pair is reciprocal with the same degree of intensity. Even though no intensive study was made, on the basis of these data we should think that in the case of some pairs, one partner was the admiring and more devoted one, whose admiration or devotion was not reciprocated in the same degree by his or her partner. This point is strikingly illustrated by the results obtained from a pair of high school subjects engaged to be married. The results computed from these subjects' estimates following their participation in the study showed a high positive relationship. A few days after their participation in the experiment, however, conflict arose between the pair, and the engagement was broken on the girl's initiative. In order to compare the judgments of these subjects after this break in their positive relationship with the results already obtained while they were engaged to be married, they were brought back to participate in the experimental situation together once more. The results of this second testing were in keeping with expectation. In the case of the girl who broke the engagement with the boy, there was a large discrepancy between her estimates of his future performance and his own estimates of his future performance, as well as between her aspiration level and her estimates of his future performance. *On the other hand, there was an even smaller discrepancy between the boy's estimates of the girl's future performance and her estimates of her own future performance than at the first testing while they were engaged.* This increased affection on the boy's part at the second testing was confirmed by his behavior in the experimental situation on this second occasion. The boy made obvious attempts to regain the girl's affection, for example, rubbing her cheeks between his hands, caressing the back of her neck, standing close to her and peering directly into her eyes. The couple was later married.

This non-reciprocation of a strongly positive or negative involvement was also evident in the case of the negatively involved pair already mentioned (p. 16). It will be recalled that in this case, one subject greatly overestimated his partner's performance. This subject was overawed and fearful of his antagonist and was, at the time of the study, making overtures to him to establish friendly relations. The general tendency which came out in our results would have been further clarified had it been feasible to study intensively the degree of positive and negative relationship between members of each pair and the reciprocation or non-reciprocation of positive or negative involvements.

The situation in which these subject pairs were placed was simple: dart throwing and estimating future and past performance. Most subjects

found some challenge in the task, although a very few were indifferent to their performance (Table VII and VIII). Neither task nor instructions involved competition between pairs. However, one partner followed another at throwing; and in the cultural setting, competition in such activities is so generally taken for granted that some competitive elements were probably present in the situation.

In view of this, the findings seem all the more significant. In spite of such competitive tendencies, subjects of the most positively related groups (college sweethearts and high school "steadies") were on the average as ego-involved in their partners' performance, in their success and failure, as in their own. For these groups, the size of discrepancies between actual performance and estimates of future performance were similar for the two partners of a pair, one as Bidder and one as Estimator, and for the same subject setting his aspiration level (as Bidder) or estimating his partner's future performance (as Estimator) (See Tables II, IV). In all these instances, the subjects had positive expectations and goals related to the task for partner as well as for self. Estimates of self and of other were made in these terms. As Tables I and III indicate, this represents the modal tendency for these groups. In some cases, higher goals were set for the partner than he set for himself, or than one set for one's self. This over-estimation, characteristically associated with judgment relating to one's own performance (aspiration level), is thus found also in judgmental activity in which there is strong positive involvement with *another* person.

It should be noted, however, that the evaluation of results of the present study are not based merely on measures of over- or under-estimations of scores. The measures used in this analysis are all *difference* scores. While over-estimation may indeed be a characteristic indication of strong ego-involvement, under-estimation may, in some cases, also be such an indication. Some individuals, to protect themselves or to shelter a loved one, may keep their goals relatively low. Since this problem is not the topic of the present study, analysis was made simply in terms of *discrepancies* between judgment and performance.

For the most positively related subject pairs, past performance as perceived by the subjects characteristically exerted about the same effect on the estimation of future performance by the Bidder and by the Estimator, as well as on one's aspiration level and on his estimate of partner's future performance (Tables V and VI). In other words, the subject's goals for his own performance were as consistent as were his partner's goals for his performance. And, his goals for his own performance were as consistent as

were his goals for his partner. For these pairs, pleasure characteristically accompanied own success and partner's success; displeasure accompanied failures (Tables VII and VIII).

In contrast, the negatively related subjects estimated their own future performance in a characteristically different way than did their partners. This differential is also revealed in comparing their estimates of own future performance with their estimates of their partner's future performance. Discrepancies between one's estimate of own future performance and actual performance were significantly greater than the discrepancies for the partner's estimate of this performance, or than one's estimate of partner's performance (Tables I—IV). In the presence of an antagonist, goals are set with less regard for one's own actual performance than one's partner pays, judging his rival in action. Past performance exerts significantly less effect on the estimates of he who throws and must keep his chin up, than on his antagonist who watches and is, perhaps, not even ashamed to be pleased at his failures and a bit disgruntled at his successes (Tables V, VII, and VIII). And when this person who was throwing sits down to observe his antagonist, he too can afford to pay more heed to the realities of past performance in estimating his rival's performance than he could when he was on the spot (Table VI).

The smaller and less significant discrepancies in accuracy and consistency found in the cases of pairs of friends are in line with the hypotheses and clarify the results. When the pairs were strongly involved in a positive way, they brought relatively little competition and strong identification into this situation. Discrepancies in accuracy and consistency were small and insignificant. The negatively related subjects (H. S. n) brought not only competition, but hostile rivalry with one another into the objectively same situation. Discrepancies in accuracy and consistency scores were large, with Bidder's being the least accurate and most consistent. The friends were chosen as good friends in terms of their associations. While they were positively involved with one another, while identification was present so that there was, on the whole, pleasure at each other's successes and disappointment at each other's failures (Tables VII and VIII), they also *competed* as friends. This competition produced significant discrepancies, but smaller than for antagonistic rivals (H. S. n), in accuracy and consistency of Bidder and Estimator, with the Bidder being less accurate and more consistent than Estimator.

In addition to the competitive factors that entered into the production of these small, but significant discrepancies in accuracy and consistency for pairs mildly involved as friends, it is probable that the task was too structured



to reveal in any clearcut way the involvements of these subjects. Internal factors are most fully revealed in situations with little objective structure. It will be recalled that this dart throwing situation even with the scored target removed, was relatively structured, as revealed by the close correspondence between actual performance and the subject's perception of that performance (p. 11). In a situation with less objective structure, we would expect discrepancies between judgments of individuals mildly involved in a positive way to be even smaller and, if little or no competition entered the situation, insignificant.

Thus, these paired subjects, with differing personal relationships and involvements, the validity of which is found in life situations, reacted in characteristically different fashions in this situation. The discrepancies between judgment and performance of Bidder and of Estimator were in line with those predicted in terms of the direction (positive and negative) and intensity of their involvements with each other.

The practical possibility which these findings open is the use of such an *indirect method* as a predictive index of the relationship between individuals. The difficulties and faults of direct verbal or paper-and-pencil methods are too well known to warrant discussion here. The advantages of discovering the relationship between individuals without their being aware of this aim are obvious. The analysis of the measures used in the present study indicates that this design could serve as a model for such a method. It is probable that dart throwing would not be an appropriate task for all kinds of subjects. Subjects at the high school level seem to be challenged by the task more than subjects on the college level. From a theoretical point of view, if the task to be judged has less objective structure than the present one, greater discrepancies between groups should be found, inasmuch as internal factors (ego-involvements in this particular case) would assume even greater weight in the total situation. *The procedures used in this study are effective in tapping strong involvements either in the positive or negative direction.* However, they are not sufficiently sensitive to reveal in clear cut fashion milder involvements, as shown by the significant, though small discrepancies between friends. In order to do so, a less structured situation should be employed. But it must be remembered that a situation of little structure will also reveal competitive tendencies more clearly while individuals strongly involved in a positive way bring such strong identifications to the situation that rivalry is virtually impossible and the negatively involved pairs brought their intense rivalry into this situation as well as in daily life encounters, the friends competed in a friendly fashion, as friends do at such tasks. The situation to be developed

to tap milder relationships, therefore, must not only be less structured but must contain no features which situationally impose competition, e.g., as does a task commonly associated with competitive sports.

Perhaps one more methodological caution is needed. If the ego-involvements of two individuals with a certain relationship are to be tapped, not only must they be unaware of this aim, but also the situation must not strongly impose a new, temporary relationship, e.g., relatedness merely as two subjects being tested by a psychologist. For this reason, the atmosphere must be easy and casual, so that the actually established relationship between subjects is revealed. Even sweethearts may act and feel like strangers in an overwhelmingly formal situation.

### *Summary and Conclusions*

The present experiment was conceived as a specific case of differential behavior resulting from variation of a crucial factor within the frame of reference at a given time. In this study, the variable factor was internal—the direction and intensity of ego-involvements between subjects. The objective task—dart throwing and estimating one's own and one's partner's past and future performance—was the same for all subjects.

Four groups of subjects were selected on the basis of observed behavior which indicated the relationship and involvement in question.

Two groups of subject pairs, college sweethearts ( $N = 40$ ) and high school "steadies" ( $N = 40$ ) were selected as being strongly and positively ego-involved with one another.

One group of high school subject pairs ( $N = 20$ ) was selected as friends.

One group of high school subject pairs ( $N = 40$ ) was selected as negatively ego-involved on the basis that they had fought or attempted to fight with one another or were competing for the same goal.

Each subject of a pair had a turn at throwing darts and estimating his own future and actual performance for 50 trials (as Bidder), and a turn at observing his partner throw and estimating his partner's future and actual performance for 50 trials (as Estimator).

Data for each S thus consisted of 100 judgments of future and actual performance on each of his own trials (as Bidder) and 100 judgments of future and actual performance on each of his partner's trials (as Estimator). After the session, each subject filled in a questionnaire.

The results indicate:

(1) When two individuals are strongly ego-involved with one another in a positive way, there are no significant differences between one's estimate

of future performance and one's partner's estimate of that same future performance in terms of *accuracy* and of *consistency*. Nor are there significant differences between estimates of own future performance and estimates of one's partner's future performance in terms of accuracy and consistency. Pleasure accompanies success and displeasure accompanies failure both for self and for partner.

(2) When two individuals are less strongly involved in a positive direction as friends, some friendly competition enters the situation. Small discrepancies are found between estimating own future performance and another's estimate of this future performance. The Bidder is significantly more consistent in setting his goals than the Estimator is in estimating the Bidder's future performance. And estimates of own future performance are significantly less accurate and more consistent than estimates of one's partner's future performance.

(3) When two individuals are negatively involved as antagonists, the rivalry produces rather wide and significant discrepancies between setting of goals for his own performance by the Bidder and estimation of this future performance by his rival (viz. Estimator). The Bidder is significantly less accurate and more consistent than is the Estimator. And the estimates of subjects as Bidders are significantly less accurate and more consistent than estimates of these same subjects when their roles were changed to that of Estimators. The expressed feelings at one's own success and failure were strikingly different from feelings at the partner's success and failure.

From a *theoretical point of view*, these results clearly indicate that it is erroneous to draw demarcations between aspiration level and judgment. Differences in judgmental activity related to self and to others can properly be explained in terms of differences in direction and intensity of ego-involvements of the individuals in question which enter in functional relation with other internal and external factors in the frame of reference. This is but one example of differential reactions resulting from variation of crucial factors in the frame of reference within which reaction takes place. With such functional analysis, sharp delineations between various sorts of discriminatory activity, e.g., fact and value judgments, will become superfluous.

Since for every group, the similarities and discrepancies in estimating were in line with the predictions made on the basis of the human relationships between pairs, this experiment offers practical leads for the development of an *indirect method* for predicting the relationship (positive or negative and degrees thereof) between individuals.



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## THE USE OF A SOCIOMETRIC TEST AS A PREDICTOR OF COMBAT UNIT EFFECTIVENESS<sup>1</sup>

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The Institute for Research in Human Relations, under contract with the Personnel Research Section of the Adjutant General's Office, was assigned to "develop measures of effectiveness for small combat units." A Moreno technique, the Sociometric Test was one of the predictors developed. A field problem for scout squads of reconnaissance platoons was developed as a criterion of the effectiveness of that squad's field performance. The scout squad is made up of six armed men with full field equipment and two jeeps; one jeep contains a radio and the other has a light machine gun mounted upon it. Under "normal" combat conditions the squad leader and two of his men ride in one jeep while the assistant squad leader rides in the other jeep with the remaining two men. The field problem consisted of twelve tactical situations, such as an air attack, the outposting of a road junction, a withdrawal, etc., which were constructed to represent battlefield conditions, as nearly as possible. These twelve situations had been agreed upon by a group of military experts to be representative of the normal combat functioning of this type of unit. The field problem required about six hours to complete and was run over a circular course covering a wide variety of terrain features. All of the twelve squads used in the problem were from the same regiment, had had about the same amount of training, and were tested at the same military reservation. The rating of combat behavior was done by personnel from the Institute and the military on a standardized rating form while closely following the squads in the field. The squads to be tested were first given the various predictors, including the Sociometric Test, and were then taken to the problem area and conducted through the field problem.

The purpose of constructing the Sociometric Test was to develop a paper and pencil measure of group cohesion; the assumption being that group cohesion and group performance are related. It was further hypothesized that Army social interactions may be categorized into three areas of interaction. These areas are:

First, a *Non-Military Area* that is thought to consist of social interactions that take place outside of the military structure while on a leave

<sup>1</sup> This paper was in part presented at the 1951 meeting of the American Psychological Association.

or pass status off the reservation. This area is represented in the Sociometric Test by the following questions:

If you were going on pass what man (or men) would you *want* to go on pass with and what man (or men) would you *not want* to go with?  
If you were going to a party or dance tomorrow what man (or men) would you *want* to have there and what man (or men) would you *not want* to have there?

If you had a leave to go home what man (or men) would you *want* to invite to your home and what man (or men) would you *not want* to invite to your home?

Second, a *Garrison Area* consisting of on the reservation social interactions that occur within the military structure but which are of a non-tactical nature. This is represented by the following questions:

If you were going to chow what man (or men) would you *want* to sit with and what man (or men) would you *not want* to sit with?

If your outfit was having a good movie tonight what man (or men) would you *want* to go with and what man (or men) would you *not want* to go with?

If you were told to pick the men whom you wanted to live in a tent or barracks with what man (or men) would you *choose* and what man (or men) would you *not choose*?

Third, a *Tactical or Field Area* of social interactions occurring "in the field" which are structured by a tactical military situation. This area is represented by the following questions in the test:

During an attack what man (or men) would you *choose* to share a foxhole with and what man (or men) would you *not choose* to share a foxhole with?

If you were to lead an advance through an enemy town what man (or men) would you *choose* to cover you and what man (or men) would you *not choose* to cover you?

If you were wounded what man (or men) would you choose to help you back to an aid station and what man (or men) would you *not choose* to help you back to an aid station?

The nine questions above were selected from a collection of suggested items gathered by interviewing combat veterans of World War II. The criteria for the selection of the items were that they:

1. Tap situations that occur with a high degree of frequency in all Army combat units.
2. Overlap as little as possible.

3. Be worded so that it would be both possible and logical for the respondent to make a positive, negative or no response choice.

Three different scores can be arrived at by assigning a unit weight to each of the positive and negative responses and summing different combinations of these responses. The three different scores and the methods of obtaining them are:

1. A score indicating the expressed attitude of one member of the group towards the rest of the group may be obtained by summing all of that individual's responses.
2. A score indicating the expressed attitude of the group towards any member of the group may be found by adding all of the responses made by others about that particular individual. This score may be thought of as an index of leadership or leadership potential.
3. A score indicating the extent of group cohesion may be derived by adding all of the response the group made. This score is the one which is to be considered here.

The present format was developed in an attempt to minimize three factors which often have been found to be quite bothersome in the construction of sociometric tests. These three factors or difficulties are the halo effect produced in subsequent items by the patterning of previous responses, the tendency for a respondent to change a choice already made after discovering that the question has another aspect to it (either positive or negative), and the paucity of responses when written responses are required of a non verbally oriented population such as we are dealing with here. These three difficulties have been somewhat minimized in this format by:

1. Putting each item on a separate page to reduce the "halo effect" of previous responses.
2. Presenting the entire question, both the positive and negative side of it, first as a unit, and then asking for the positive or negative choice *after* both aspects have been considered, to reduce the tendency of some respondents to change responses after they have once been made.
3. Having the respondent write each man's name only once to reduce the possibility of limiting the number of responses as a result of the respondent's resistance to a writing situation.

A rank order coefficient of correlation was run between the total score (the index of group cohesion) received on the Sociometric Test by each squad and the total score received on the field problem by each squad. This correlation produced a rho of .77 which is significant for a N of 12 (squads) above the 1% level of a confidence. Other rho coefficients found were:

Criterion and Garrison area	.62
Criterion and Social area	.78
Criterion and Tactical area	.79

As would be expected from the above statistics these three areas of social interactions are highly intercorrelated, with the Tactical and Social Areas correlating highest ( $\rho$  of .84) and the Garrison Area correlating somewhat lower with the other two areas ( $\rho$ 's of .68 and .76). The lower correlations of the Garrison Area with the other two areas may be partially understood when the  $\rho$ 's between each question and the criterion of field performance are examined. It was found that two of the garrison questions (going to chow and going to a movie) had  $\rho$ 's of only .46 and .44 while the other seven of the questions all correlated with the criterion with rank order coefficients of correlation ranging from .63 to .75. It is felt that the two "weak sisters" in the Garrison Area are weak because they involve social interactions of a less intimate degree of association than the other items. This is manifested in the observation (at the military reservation where the testing was conducted) that inter-personal choices in these two situations (going to chow and going to the movies) are made relatively casually and indiscriminately as compared to, say, those made when going on a pass.

It is regrettable that reliability coefficients cannot be reported for the Sociometric Test but a rapid turnover of personnel in the units used in the study occurred shortly after the testing as a consequence of the outbreak of hostilities in Korea. This prevented re-testing of the original sample.

INDEX OF GROUP COHESION AND TOTAL FIELD PROBLEM SCORE  
FOR EACH SQUAD

Squad	Index of Group Cohesion	Total Field Problem Score
A	210	85
B	193	82
C	256	77
D	160	74
E	178	68
F	185	66
G	185	65
H	171	64
I	186	63
J	119	58.3
K	38	57.8
L	108	57

The correlation of .77 indicates that the group cohesion score received on the Sociometric Test is related in a positive manner to performance on the Scout Squad Field Problem. It is felt that this Sociometric Test could be applied with equal facility to any other Army combat unit and with changes of terminology in a few questions it could be applied to almost any small organized unit in the armed forces or industry as a predictor of group performance. Further research, however, would have to determine the effectiveness of that prediction of other groups.



AN EMPIRICAL VALIDATION OF A RIGIDITY SCALE  
AGAINST A CRITERION OF RIGIDITY IN AN  
INTERPERSONAL SITUATION\*

AN APPLICATION OF THE SPONTANEITY TEST

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INTRODUCTION

Although rigidity has been studied in many contexts in the analysis of human behavior, there is no unanimity in the field as to its nature nor any consistency in its use as a construct. Some of the following formulations have been advanced, and it can be observed that the concepts are quite heterogeneous. Rigidity has been thought of as a general personality trait, a defense against anxiety, as an intellectual ability, as due to cortical pathology, or simply as a perseverating response tendency.

The factor analysts, notably Spearman and his students (29) have isolated a perseveration factor, (P), in tasks involving alternation of simple motor responses, alternation of creative effort, or persistence in single activity. Thurstone similarly isolated a factor (E) which he labeled ability to shift set (33). Both of these are similar, however, to the rigidity concept utilized by Cattell (6). Based on tasks involving alternation of creative effort, Cattell's "Disposition Rigidity" factor is found in tasks demanding a new approach to an old situation. He considers it is a general personality characteristic not necessarily related to intelligence. Thus factor analysts conceive of rigidity sometimes as an intellectual ability and at other times as a general personality trait.

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Goldstein (12) has conceptualized rigidity predominantly in terms of neuropathology. But he emphasizes two kinds: primary rigidity and secondary rigidity. Primary rigidity refers to "... sequelae of an abnormality of the Einstellung mechanism, most frequently observed in lesions of the subcortical ganglia. Each performance in action immediately becomes so rigid that responses to extraneous stimuli cease. Secondary rigidity is due to a primary defect of the higher mental processes occurring in cortical damage and cortical malformations, such as feeble-mindedness. It occurs only if the individual is confronted with tasks beyond his capabilities" (12, p. 225). This latter concept Goldstein admits may be true of normal people also; that is, they may exhibit rigidity when in performances beyond their capacities. This conception is also developed by the field theorists in discussing stereotyped behavior (14, 16, 20). Lack of variability and adaptability are behavioral indications of this rigidity.

The psychoanalytic theorists (10) speak of rigidity as an ego mechanism utilized as a defense against anxiety. These formulations include not only descriptions of response characteristics but also some treatment of motivational factors as well. In their thinking rigid behavior is clearly a personality characteristic independent of ability and specifically related to anxiety as the motivational source.

In general, then, all these different concepts of rigidity have in common the definition of the response itself. The nature of rigidity is conceived by all as a lack of variability and stereotypy of response tendencies. However, the concepts differ in the determiners of the behavior. There is no conclusive evidence bearing on the generality of the trait of rigidity. It can hardly be assumed that the factor analysts have uncovered a general trait because the tasks with which they define the factor of perseveration do not include situations involving interpersonal relationships, for example. The tasks themselves are very limited and for the most part are motor tasks. Two attempts have recently been made to investigate the generality of the trait of rigidity by means of general personality trait scales. The rationale behind this approach is to derive a scale that might measure this trait and then to determine functional relationships with other indices of rigidity. Rokeach used the California Ethnocentrism Scale (26). It was hypothesized that highly ethnocentric individuals were rigid not only in their approach to social problems; i.e., that this was not an isolated phenomenon, but rather that their rigidity was a generalized trait which would manifest itself in solving any problems, social or otherwise. He defined his populations in terms of their score on the Ethnocentrism scale and studied their responses

on the Luchins mathematical problem-solving tests (17). These tests are mathematical problems (water jar problems—to measure *Einstellung*) having one method of solution with additional problems in which this practiced method could be continued or a new, more simple direct solution could be used. Rokeach analyzed the responses of the subjects to these mathematical problems; if they continued using the practiced method of solution, they were considered rigid in not shifting to a more direct technique. He discovered that the more ethnocentric people, as measured by his scale, were more “rigid” on the problem-solving. Another study by Cowen and Thompson (8) was recently reported in the literature in which people failing on these Luchins water jar problems also showed rigidity in their Rorschach protocols. This included: limited productivity and imaginativeness, and inability to enter psychologically new situations, a poorer adjustment to society than normal subjects.

Another attempt at using a scale to measure a general trait was carried out by Wesley (37). She attempted to discover the generality of the trait of rigidity in a similar manner using different measures. Working with the definition of rigidity that “the tendency to persist in responses that may previously have been suitable in some former situation but that no longer appear adequate to achieve current goals or to solve current problems, as considered from the point of view of an observer,” Wesley constructed a scale of test items to measure this general personality trait. Following the procedure used by Taylor (32) to devise an Anxiety Scale, Wesley used the judgments of five clinicians about a large number of items. On the basis of their opinions as to the statements indicative of rigidity, fifty items were selected. To determine whether the scale had any validity, the relationship to concept formation was explored. The Wisconsin Card Sorting Test developed by Berg and Grant (2) was given to subjects scoring high and low on the rigidity scale. This sorting test, which is modeled after the Weigl, requires shifts in conceptual sets. The subjects are required to learn to sort the cards according to certain cues, either color, form, or number, until they reach a specified criterion of performance. Then, without their knowledge, the experimenter arbitrarily changes the correct basis for sorting so that the subjects are then required to shift their set and learn to sort the cards according to a new cue. It was predicted that the highly rigid subjects would take longer to shift their set under these conditions than would the non-rigid subjects. Wesley’s results indicated that the individuals scoring high on the R Scale exhibited significantly more perseveration and greater difficulty in shifting than did those low on the R Scale.

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Is this self-rating behavior (R Scale) predictive of rigidity in situations involving interpersonal relationships? In a situational task such as used by the OSS (25) or Moreno (22) or Bronfenbrenner (3), will the individuals who rank highest on the scale also exhibit inflexible behavior? These questions are basic in establishing the validity of this scale. If it can be shown that subjects on the basis of this scale are also differentiated in these behavioral situations, then it will support the use of the scale as a discriminating instrument and will aid in further research in personality dynamics. The problem then posed was whether this trait of rigidity as measured by the R Scale was a trait with sufficient generality to manifest itself in complex behavioral situations.

#### STATEMENT OF THE PROBLEM

The purpose of the present investigation was to explore the generality of measured rigidity; to determine whether the general trait of rigidity, the R Scale, will manifest itself in complex behavioral situations and to determine whether anxiety, experimentally induced, affects this tendency or brings it about in individuals supposedly free of this tendency. In order to study this, a form of "spontaneity test" (22) was used.

The "spontaneity test" developed by Moreno, places the subject in a life situation in which frustrating developments take place without explicit rewards. The subject is constantly called upon to adapt to the changing situation and observers can determine whether he is adapting flexibly or not. His response to new surprises will allow the observers to determine the degree of rigidity or flexibility displayed. A selling situation was utilized in this research in which the subject was called upon to sell Christmas cards and had to adapt to a frustrating buyer who continually negated their approaches to him. Flexible subjects changed their approaches when the situation changed. It can be assumed that individuals who differ in ease of warming to a task, in the number of new and varied approaches to a frustrating situation, in the variety of verbal expressions used to make particular points, differ in degree of rigidity. This use of a work-sample furnishes a closer approximation to life situations than the tasks which are far removed from practical every-day experience.

#### PROCEDURE

*Subjects*—Sixty-six male students from the introductory psychology class in 1st and 2nd semesters, 1950-51 were selected for this study on the basis of their scores on the Anxiety Scale, the revised Rigidity Scale, and the

L Scale of the MMPI. These scales make up the major portion of the "Biographical Inventory" which is routinely administered to all introductory psychology students.

The following diagram shows the manner in which the subjects were assigned.

		Rigidity Conditions	
Instruction Conditions	STRESS	<b>RIGID</b>  <b>RS</b> <b>N = 18</b>	<b>FLEXIBLE</b>  <b>FS</b> <b>N = 15</b>
	NEUTRAL	<b>RN</b> <b>N = 18</b>	<b>FN</b> <b>N = 15</b>

Figure 1

All subjects scored between the 20 percentile and 80 percentile on the Anxiety Scale, below the 90 percentile on the L Scale and either above 80 percentile on the Rigidity Scale (Rigid Group) or below 20 percentile on the Rigidity Scale (Flexible Group). The thirty-six Rigid subjects were randomized into two groups which received either neutral or anxiety-inducing instructions. The thirty Flexible subjects (we are interpreting the lower end of R scale as "flexibility") were randomized in the same manner.

All subjects took two verbal fluency tests described by Taylor (31). These tests were administered as part of a series of tests which included a memory test, arithmetic problems, and addition problems. The two tests were:

- Write all the words you know beginning with "S".
- Write all the words you know beginning with "T" and ending with "E".

Both of these tests were high on Taylor's Word Fluency Factor, (W). Since the subjects were randomly assigned to either neutral or anxiety-inducing conditions for the Spontaneity Test, no attempt was made to equate for word fluency. These tests were included to measure the facility with words of the subjects. It might be assumed that the more "verbal" a subject, the more flexible he might be considered. This is particularly true here where the



judges have only the transcriptions of the situation. These tests, then, gave an estimate of the verbal fluency of the subjects. The scores on the two word fluency tests were normalized so that they could be averaged. For each decile, a standard score was obtained and the standard scores from the "S" and "T & E" tests were then averaged. Thus one score indicated the subjects average performance on the two tests. This average was then used as an indication of the subjects' verbal fluency. Cattell (7) has suggested that verbal fluency, associational fluency, and intelligence should be accounted for before estimating rigidity so that these other variables would not unduly influence the judges. Therefore, fluency of association tests were also given the subject after the spontaneity test and an estimate of the subjects' intellectual ability was obtained. The measure used here was the composite score on the battery of tests given to all incoming freshmen at the State University of Iowa.

### *Materials*

The Magnecorder with plastic-backed tapes and a tripod microphone was used to record the behavior in the spontaneity test. The experimental room was equipped with a desk on which the Magnecorder rested, the microphone on the opposite corner of the room and two chairs placed widely in the room.

### *Procedure*

The subjects entered the experimental room and were given preliminary instructions which were designed to be either neutral or anxiety-inducing. Then, all subjects received similar instructions for the test situation proper.

#### *Instructions to Subjects in Spontaneity Test*

For the anxiety-inducing instructions:

Your name was chosen for this experiment because you did rather poorly on those tests you took a while ago. Remember? The test on which you had to remember the first names and write all the words beginning with "S" and so on. Well, I checked up on you and I'm interested in seeing if you can't do better on this particular intelligence test we're going to give you now. This is a new intelligence test which we found correlates very highly with the standard intelligence tests. Only this one calls for your ingenuity in a more practical situation. We're very disturbed about your performance on those other tests and hope you'll do better this time. We're recording to keep a better check.

For the neutral instructions:

Your name was chosen for this experiment by a random number procedure. All the men's names in the class were placed in a hat and



every 20th name was chosen. For this experiment we're planning to run a number of different situations to see which is best. We have no basis for comparison so we don't know which situation will produce those results. We're not interested in individual records but rather average records for a large group. Here's the one we'll try this time. We're recording to keep a better check.

All subjects were then given the following instructions:

Now let's say your name is Bob (if it is Bob, call him Bill). If you had your choice of whatever you wanted from Sears and Roebuck, Bob, and were free to choose, what would you choose? . . . Well, that's a coincidence. It happens that Crosby Christmas Card Company is giving as a prize, to the man in Iowa City who sells the most Crosby Christmas cards . . . (whatever the subject chose). Now you want this . . . very much and you have decided to sell Christmas Cards and try and win it. Let us say it's three weeks until Christmas. Of course, you'll get a commission anyway but you're more interested in winning this prize. So you're a Crosby Christmas Card salesman, O.K.? Here is a box of samples (E hands S imaginary box of cards). And here comes John Smith (second E approaches). You were introduced to him once before and you know him slightly. Try and get an order from him.

Following the instructions the recorder was turned on (the raters therefore did not know which subjects received the anxiety instructions or the neutral instructions). The experimenter dropped back and monitored the recorder. "John Smith" was the same person for all subjects and tried to maintain a uniform pattern of response. His attitude was skeptical and doubtful but not hostile nor overly warm. His replies throughout the situation were essentially (1) "I don't know," or (2) "I haven't thought much about it." The only decisions he made were irrelevant ones such as going some place to talk it over (using two chairs), etc.

After four and one-half minutes had elapsed, "John Smith" routinely presented a "surprise." He remarked:

The real reason that I've been so reluctant to buy these cards is that I read in the newspaper the other day that Mr. Crosby, the President of the Crosby Christmas Card Company, has been found guilty of fraud and misrepresentation on this whole Christmas Card deal.

When questioned, he reiterated that he had read it in a local paper. His attitude forced the S's to try a different approach because the response given previously was no longer adequate.

After this session the S's were taken to another room and given the Sentence Fluency and Similes tests. These tests were included in the study because they were both high on the Ideational Fluency (F) and Verbal

Versatility (K) factors described by Taylor (31). Scores on these tests were simply the number of sentences written and the number of phrases used to complete the similes. In each of these tests a shift in ideas is required. Different kinds of sentences and different kinds of similes endings were called for in a limited amount of time. It may be hypothesized a priori that this kind of shifting that is called for might be a function of manifest rigidity (see discussion section). Cattell argues that this fluency is not to be confused with the more essential rigidity. He asserts that psychiatrists have designed fluency tests to measure rigidity such that low fluency is high rigidity. He states, "It is possible that there is more than one factor of fluency, but it suffices if we recognize that such a factor (or factors) constitutes the second source of apparent rigidity and may be set aside along with intelligence, as something already sufficiently in process of study for its own sake and not to be confused with the more essential rigidity we are seeking to isolate" (7, p. 323). Therefore, besides the word fluency tests already employed in this study, ideational fluency and verbal versatility tests have been included to obtain a measure of the subjects' "other fluencies."

### *Ratings*

Five judges rated the recorded behavior. These raters were all clinical psychologists who had had considerable experience. They used a seven-point scale to rate rigidity of behavior. The judges were thoroughly instructed as to the nature of rigidity as measured here and were given practice drills on special recorded material. Each judge had one training session and rated no more than 12 subjects on each subsequent rating session.

### *Instructions to Judges*

You are going to listen to the tape recorder and attempt to rate the individual you hear on a seven (7) point scale as to the degree of rigidity you feel is represented. Do not place your ratings within too narrow a range. Use the complete scale.

RIGIDITY used here is defined as:

"... the tendency to persist in responses that may previously have been suitable in this or some other situation but that no longer appear adequate to achieve current goals or to solve current problems, as considered from the point of view of an observer."

Take plenty of time to make your rating. Rate each of the sub-groups that are present on the rating sheet and make an over-all evaluation at the top of the rating sheet. Make each rating a fresh judgment unprejudiced by previous judgments.

In the situation you are about to hear, rigidity may be defined as:

- 1— very few approaches
- 2— many repetitions
- 3— similar verbal expressions
- 4— slowness in giving up old approaches
- 5— lack of novelty of approaches
- 6— difficulty in accepting the hypothetical situation itself
- 7— difficulty in adapting to the "surprise" at the end

Since rigidity is the only "personality variable" we are interested in, do not be confused by what may be shyness, anxiety, aggressiveness, impulsiveness, etc. Although these characteristics may also be apparent, restrict your attention to "rigidity" only.

### *Judges' Rating Scale*

Subject # .....

Final Rating .....

#### TRAIT

- |                                                       |                       |
|-------------------------------------------------------|-----------------------|
| 1. Ease in accepting the conditions of the situation: | 1..2..3..4..5..6..7.. |
| a) Accepts name of Bob.                               |                       |
| b) Asks questions of examiner.                        |                       |
| 2. Tries many different approaches.                   | 1..2..3..4..5..6..7.. |
| 3. Uses different verbal expressions.                 | 1..2..3..4..5..6..7.. |
| 4. Perseverates in old approaches.                    | 1..2..3..4..5..6..7.. |
| 5. Uses novelty in approaches.                        | 1..2..3..4..5..6..7.. |
| 6. Appropriateness of responses.                      | 1..2..3..4..5..6..7.. |
| 7. Ability to handle "surprise" at end of situation.  | 1..2..3..4..5..6..7.. |
| 8. Length of time before trying different approaches. | 1..2..3..4..5..6..7.. |

All these sub-ratings will aid you in making a final overall rating. The overall rating is not a mere average of the sub-ratings but rather a composite of them plus your subjective impression.

Notes

Tab.

Approaches .....

Repetitions .....

RATER .....

#### RESULTS

Before determining the relationship between manifest rigidity as measured by the R Scale and rigidity in the behavioral situation as measured by the raters, it appeared desirable to investigate the relationship between the paper and pencil inventories used to define our groups. Wesley (37) obtained a correlation between the A Scale and the R Scale, given in

September 1949, of plus .10 (not significantly different from zero). This Pearson  $r$  was computed for the September 1950 and February 1951 results. The correlation coefficients were plus .05 and plus .06 respectively (not significantly different from zero). Therefore no reliable relationship exists between the two scales. Since the R scores were the criteria in the choice of subjects, our groups were either flexible or rigid as defined by the R Scale and were not anxious as defined by the A Scale.

### *Rater Reliability*

An estimate of the reliability of the raters was obtained using the method described by Hoyt (13). See Table I.

TABLE I  
ANALYSIS OF VARIANCE FOR FIVE RATERS AND 66 SUBJECTS AND THE RELIABILITY  
COEFFICIENT OBTAINED FROM IT

Source	SS	df	Variance
Raters	12.59	4	3.143
Individuals	655.69	65	10.083
Remainder	297.81	260	1.145
Total	966.09	329	

$$r_{jj} \text{ equals } \frac{10.088 - 1.145}{10.088}$$

$$r_{jj} \text{ equals } .89$$

There were eight sub-scores which were used as aids for the raters in making their final evaluation. All raters were instructed to make ratings on all of these sub-scores although much freedom was allowed and urged in the making of the final rating. Table II indicates the reliability of the raters' judgments in each of these eight categories.

Category No. 7, "Ability to Handle the Surprise at the End of the Situation," yielded the highest reliability (.88), and a product moment correlation between category 7 and the final rating was plus .94. In the subsequent complex analysis of variance, both the final rating and category 7 rating were employed separately.

### *Verbal Fluency*

Bartlett's Test for homogeneity of variances was applied to the means and standard deviations of the word fluency scores and indicated that the variances were homogeneous in all groups. The F test for the difference between the means was not significant. F equaled 0.408 for 3 and 62

degrees of freedom. Therefore the groups may be considered equally fluent with words. See Table III for analysis of variance. A product-moment

TABLE II  
RELIABILITIES OF JUDGE'S RATINGS ON EIGHT SUB-SCORES OF RATING SCALE  
(N = 66, FIVE JUDGES)

Subscores	r
1. Ease in Accepting the Conditions of the Situation	0.78
2. Tries Many Different Approaches	0.83
3. Uses Different Verbal Expressions	0.49
4. Perseverates in Old Approaches	0.72
5. Uses Novelty in Approaches	0.81
6. Appropriateness of Responses	0.60
7. Ability to Handle the Surprise at the End of the Situation	0.88
8. Length of Time Before Trying Different Approaches	0.84

TABLE III  
SIMPLE ANALYSIS OF VARIANCE OF THE DIFFERENCES BETWEEN MEAN VERBAL FLUENCY  
SCORES OF 66 SUBJECTS (IN TERMS OF NORMALIZED STANDARD SCORES)

Source	SS	df	Mean Square	F
Between Groups	0.73	3	0.243	.408 (n.s.)
Within Cells	36.90	62	0.595	
Total	37.63	65		

correlation between the word fluency score and the judges' final rating for each subject was determined. The Pearson  $r$  was plus .14 (which, with 65 df, is not significantly different from zero). Therefore, the judges were not influenced by verbal fluency nor were the groups different in this ability.

#### *Ideational Fluency and Verbal Versatility*

The following correlations were computed to note the relationship between these two non-experimental variables and (1) the final composite ratings and (2) the R Scale. See Table IV.

(1) The Sentence Fluency test and Similes Test correlate plus .34, which is significant beyond the 1% level. This, of course, was to be expected since both tests are high on the same factors.

(2) The composite ratings correlated plus .26 (significant beyond the 5% level of confidence) with the Sentence Fluency Test.

(3) The composite ratings and Similes Test correlated plus .37 (significant beyond the 1% level of confidence). All the above-mentioned

TABLE IV  
INTERCORRELATIONS OF NON-EXPERIMENTAL VARIABLES (SENTENCE FLUENCY AND  
SIMILES TESTS) WITH COMPOSITE RATINGS AND R SCALE

	Sentence Fluency	Similes
Composite Rating	0.26*	0.37**
R Scale	0.01	0.01
Similes	0.34**	

\*Significant beyond 5% level.

\*\*Significant beyond 1% level.

correlations were Pearson product moments coefficients since the data were such that the assumptions were met.

(4) The R Scale correlated plus .01 (not significantly different from zero) with the Sentence Fluency Test.

(5) The R Scale scores correlated plus .01 (not significantly different from zero) with the Similes Test.

Both correlations in Nos. 4 and 5 were computed using biserial  $r$  from widespread classes. The nature of the data precluded use of any other correlation coefficient because the R Scale scores were taken from the extremes of the distribution. However, biserial  $r$  from widespread classes takes into account this exclusion and adjusts for it.

An estimate of the intellectual ability of the subjects was obtained. The composite entrance examination scores was used. This examination is given to all entering freshmen and transfer students routinely. The composite score is made up of six tests: (1) English placement test, (2) Interpretation of reading materials in Social Studies, (3) Interpretation of reading materials in Natural Sciences, (4) Interpretation of Literary Materials, (5) Basic skills in mathematics, and (6) General Vocabulary. These composite scores were correlated with the final ratings to determine whether intellectual ability influenced the judges' ratings. The product-moment correlation coefficient obtained was minus .19 which, for 56 degrees of freedom, is not significantly different from zero. An  $N$  of 57 was used here because nine subjects had no composite score listed.

### *Selling Experience*

It was felt that subjects who had had some selling experience might conceivably have some advantage in this behavioral situation. Although, ideally, the spontaneity test should allow the subject to express his characteristic mode of adaptation to changing situations and surprises, it may be that it reflects more specific kinds of responses in a more specific



situation rather than a general mode of behavior. A measure was obtained at the close of the behavioral sample of the selling experience of the subject. He was asked whether he had ever done any selling and of what sort. Twenty-nine subjects described some previous selling experiences or training.

In relation to the ratings on performance in the behavioral situation, the mean composite rating of those subjects who reported selling experience was 3.90. The mean rating of those without selling experience was 4.62. For 64 degrees of freedom a  $t$  for unrelated measures was 2.00, which is significant beyond the 5% level of confidence. See Table V.

TABLE V  
MEANS AND STANDARD DEVIATIONS OF RATINGS OF INDIVIDUALS WITH AND WITHOUT PREVIOUS SELLING EXPERIENCE

	Mean Rating	S.D.	$t$
Selling Experience (N = 29)	3.90	1.32	2.000 ( $p < .05$ )
No Selling Experience (N = 37)	4.62	1.39	

A Chi Square test comparing the subjects who reported selling experience with those who did not with position on the R Scale was computed. The Chi square equaled 0.009 for 1 degree of freedom, which indicates no significant difference. See Table VI.

TABLE VI  
CHI SQUARE TEST OF INDEPENDENCE OF SELLING EXPERIENCE AND R SCALE

	Rigid	Flexible	
Experience	16	13	29
	(15.8)	(13.2)	
No Experience	20	17	37
	(20.2)	(16.8)	
	36	30	66

Chi Square = 0.009 (n.s.) (for 1 df)

#### *Comparison of the Effects of Rigidity and Anxiety*

The means of the groups were compared by analysis of variance. These data are summarized in Table VII.

TABLE VII  
ANALYSIS OF VARIANCE OF THE DIFFERENCE BETWEEN MEAN RATINGS OF RIGIDITY IN THE  
SPONTANEITY TEST  
(N = 66)

Source	SS	df	Mean Square	F
Rigidity Condition	0.10	1	0.100	0.050 (n.s.)
Instructions Condition	1.39	1	1.39	0.702 (n.s.)
Interaction RxI	0.37	1	0.37	0.168 (n.s.)
Within Cells	122.93	62	1.98	
Total	124.79	65		

It can be seen that there was no relationship between performance in the spontaneity tests as determined by raters and performance on the paper-pencil inventory, the R Scale. The F for the rigidity condition was 0.05. The anxiety-inducing instructions did not cause differential performance on the behavioral test either. This F was 0.702. The within cells variance was uniformly larger than the between groups variance; most of the variation was within each group rather than between the conditions.

The reliabilities of the judges' ratings as indicated in Table II ranged from .49 to .88. Although some of the reliabilities reported are low, and making a composite rating when judges show inconsistency is questionable, an analysis of variance for each of the other sub-scores was computed. No significant difference between the means was obtained for any of these sub-score analyses.

#### DISCUSSION

It has been demonstrated here that judges, when adequately trained, can rate behavior in a highly consistent manner. The reliability estimate of the judges' consistency was .89. This is sufficiently good to use to characterize group trends. Therefore, the five ratings were pooled to obtain a composite rating which was used in the analysis of results.

The judges' ratings might have some possible errors in them. First, they might be influenced by mere word fluency of the subjects. This can be discounted, since it was demonstrated that the groups were equally verbally fluent and that the judges' ratings were not reliably correlated with the verbal fluency measures (product moment coefficient was plus .14, which was not significantly different from zero). A second possible error might be the fluency of association of the subjects which would influence the judges' ratings. Cattell mentions that some psychiatric tests attempting to measure rigidity actually measure fluency of association. Although fluency of

association could be conceivably related to rigidity, in this study the judges were not influenced by this measure. In fact, the correlation obtained between the composite ratings and ideational fluency and verbal versatility was plus .26 and plus .37, both significant. This implies that the higher the fluency score, the more rigid the subject was rated; hence the variable actually acts inversely. Perhaps the judges tended to discount the subject who was merely fluent and tended to give an estimate of rigidity which was unbiased by this variable.

The third possible error which Cattell cautions about is the intellectual ability of the subjects. The more intelligent, the less rigid they should be, supposedly. The correlation between the judges' ratings and intellectual ability was negative and not significantly different from zero (minus .19). Therefore mere intellectual ability was not being reflected in the situational task.

The hypothesis under study was that rigidity is a trait that manifests itself as a general personality characteristic. However, the results obtained indicate that the R Scale does not measure such a general trait. The individuals at the two extremes of the distribution were not differentiated significantly in performance in the complex behavioral situation. Nor did the results support the second assumption that rigidity might appear more clearly when the individuals were emotionally disturbed; that is, the individuals did not appear significantly more rigid to the judges under the induced anxiety condition. Therefore, the labeling of this scale as an unqualified measure of manifest rigidity seems unjustified.

The question arises, then: Is there really a trait of rigidity or are there simply *specific* situations in which people react rigidly or not? We might ask, rigidity for what? or rigidity how? or rigidity when? An interesting result of this study which lends credence to the specificity hypothesis is the relation of the selling experience variable to the judges' ratings. The measure obtained is admittedly crude. However, those individuals who reported such experience tended to be rated more flexible than those without this experience. This implies that even in the spontaneity test specific past experiences modify the behavior. Further research is suggested using many different spontaneity situations other than the selling situation used here and in which more systematic investigation of the effect of special experiences be attempted. It may well be demonstrated that for specific situations, specific experiences modify the behavior. It has been assumed that a work-sample type test should display general characteristics. This problem appears now a crucial one for this method of research.

Although the informal questioning procedure used to obtain an estimate of selling experience was crude, it might be expected that the kinds of people who are attracted to the selling situation—for example, those interested in meeting new persons or desiring frequent shifting of residence, etc.—would be the same individuals considered less rigid in terms of the definition of the R Scale. This hypothesis was not upheld by the Chi square test, which indicated no significant differences between flexible and rigid subjects (R scale) as to selling experience. This again raises some question as to the validity of the R Scale.

The psychoanalytic formulation of rigidity states that it is an ego defense mechanism—a mode of response which is primarily utilized as a defense against anxiety. Fenichel states:

Acute struggles with the instinctual impulses are avoided by a chronic limitation of the flexibility of the ego which is stiffened against unwelcome external or internal stimuli. In extreme cases the rigidity is a total one, in less extreme cases a relative elasticity may be preserved so that the rigid pattern becomes pronounced whenever an anxiety is felt and is somewhat relaxed whenever an experience of reassurance or pleasure permits the individual to ease the barriers. (10)

This implies, then, that rigid behavior is clearly a personality characteristic, independent of ability and specifically related to anxiety as the motivational source. In our spontaneity test, half the subjects received instructions which were designed to be anxiety-inducing. There is evidence that instructions similar to those used in this situation have caused performance decrement in specific tasks (38, 39). Yet we found no differences in rated rigidity as a result of the anxiety condition. It may be that the anxiety was not specific enough and is related only to intellectual tasks. Our results would not support this psychoanalytic concept of rigidity; however, it is felt that this is not an adequate test. It does suggest that the concept should be more systematically investigated. Farber (9) has shown that rats, after developing a fixated (rigid) response, will drop this response when the anxiety has been removed. He suggested that anxiety, when present, maintains the fixated response and no new behavior can occur until the secondary drive of anxiety is diminished. A study such as this on the human level would be a more adequate test of the psychoanalytic formulation of rigidity than would the study done here. Beier (1) worked with the concept of rigidity and demonstrated that the individuals under a state of inducted anxiety showed greater rigidity as measured by an abstract reasoning test, a sorting test, and a mirror-drawing test. Here, too, it seems likely that we are dealing with

highly specific kinds of behavior. We can then answer the question of rigidity how?—rigidity when?—and for what? But the question of a general characteristic of rigidity related to anxiety has yet to be experimentally shown.

It seems likely, then, that the validity of the R Scale is doubtful. One hypothesis why no relationship was obtained could be that subjects are not quite honest about the way they answer the true-false items. An element of projection might enter. Rather than honestly asserting that "I am a methodical person," the subject might wonder if being a methodical person is a desirable attribute and therefore answer it as true of themselves either to impress the examiners or themselves. The question of honesty has been raised in connection with the Anxiety Scale and seems to have been dispelled experimentally (personal communication from Dr. Harold P. Bechtoldt). Secondly, the difficulty may lie in the manner in which the Rigidity Scale was devised. The items were not selected on the basis of empirical analysis; that is, the responses of a defined population of rigid people and a defined population of non-rigid people were not used in the selection of the items. If it could be demonstrated that rigid people, by an independent criterion, answered certain items in a specific manner, then these items would be the ones to place in the scale to differentiate degrees of rigidity. Rather, clinicians decided, on the basis of their own experience, how rigid people would tend to answer certain items. For example, item No. 52, "I dislike to change my plans in the midst of an undertaking," if scored plus, is considered a discriminating item in that rigid people would tend to score this item plus. Clinicians decided that this was the case, and hence the item was included in the scale. However, it may be that rigid people would not score the item in this manner at all. Our only information is that clinicians think that they will. Scales of this type should be developed in an empirical manner. We may well be testing only the clinician's understanding of what rigidity is, rather than how rigid people react.\*

However, the criticism of the method of scale construction should not overlook the fact that the method was the identical one used in constructing the Anxiety Scale. This Scale has stood up in subsequent studies. The

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\* On the basis of the present results, a refined rigidity scale was attempted. The responses of individuals rated rigid were compared with those of individuals rated flexible and 38 items which differentiated these groups (differences of 20-35%) were selected. However, a cross-validation study did not uphold the new scale. It may be that the items in the inventory themselves are not adequate, but the small number of cases in the study was the most serious limitation.



crucial difference may lie in the nature of the variables themselves. The Anxiety Scale gets at the drive level of an individual, as described by Taylor (32). Hence, when you manipulate drive level you would expect differences in the responses obtained. However, the Rigidity Scale does not seem to get at the drive level; rather, it is most likely a scale of habit tendencies. Since the experimental situation calls for the social, verbal, etc., habits of the individual, an R-R relationship may or may not occur. On the other hand, the habits of the individuals at the extremes of the R Scale distribution should be qualitatively different so that in a situation involving inter-personal relationships these habits should be observed as different by the judges. This was not the case.

Investigators (26, 37) tend to develop confidence in the belief that they are dealing with rigidity as a characteristic of the personality whenever they find any relationship between measures of rigidity. The results have not tended to be conclusive in this respect. For example, Luchins criticizes Rokeach in his use of the water jar problems as a test of rigidity when he states, "The tests may test rigidity of behavior; it is not purported that they test or measure rigidity inherent in the personality" (19). This seems to refer to the specificity-generality controversy.

Wesley, for instance, was dealing only with concept formation. Yet her scale, which purported to measure a general tendency, was not shown to have this generality, i.e., the validity is questionable. For further research in this area it is suggested that we investigate what we believe to be rigidity of behavior under many different conditions—for example, many different spontaneity situations—and when we arrive at differentiated groups in these situations, then we can construct a scale to measure this tendency. The present research has not implied that scales are not useful, rather it has suggested another means of arriving at a general scale.

It seems to the author that before we can speak of a general personality characteristic or an inherent tendency, we must first have systematic studies investigating all the conditions under which rigidity is manifest. If it can be shown that we are dealing with a general trait rather than a highly specific behavior in specific conditions, then we may speak of rigidity as a personality characteristic with more assurance. At present, with the research in this area barely under way, we can only speak of specific habits under certain stimulus conditions. If the habits can be demonstrated to persist despite changes in the stimulus conditions, then and only then are we qualified to speak of a general tendency.



## SUMMARY

The term rigidity has been used to refer to several concepts: a general personality trait, dispositional rigidity, an intellectual ability, cortical pathology, an ego defense mechanism. The first of these, a general personality trait, was postulated by the factor analysts. They found this rigidity factor more or less independent of any intellectual ability, although they conceive of rigidity first as an intellectual ability. "Dispositional rigidity" was the name given to the isolated factor which was found in tasks demanding a new approach to an old situation. Cortical pathology induces rigid behavior, according to some investigators. Similarly, the rigidity of feeble-minded persons is due to a defect in the higher mental processes, affecting only those tasks which the individual is unable to cope with. Here again, rigidity is thought of as an intellectual function. Lastly, rigidity has been conceptualized as an ego defense mechanism. It is specifically related to anxiety as the motivational source. To defend the ego against anxiety, a persistent (rigid) mode of response is adopted.

Just as there are many different concepts of rigidity, there are many different ways of measuring rigid behavior. When a certain measure of rigid behavior is adopted, the experimenter first investigates the functional relationships that this measure has with other indices of rigidity, either decided upon a priori or because of previous investigation. Recently several studies have used general personality trait scales to define rigidity, and one of these (Wesley) was utilized in this validation study. Working with the definition of rigidity that "the tendency to persist in responses that may previously have been suitable in some former situation, but that no longer appear adequate to achieve current goals or to solve current problems, as considered from the point of view of an observer," Wesley attempted to construct a scale of test items to measure the general personality trait, rigidity. On the basis of clinicians' judgments as to the statements rigid people would answer as true of themselves, a 50-item Rigidity Scale was devised. It succeeded in differentiating people on ease of shifting on the Wisconsin Card Sorting test. Those individuals scoring high on the R Scale exhibited significantly more perseveration and greater difficulty in shifting than did those low on the R Scale. The problem then posed was whether this trait of rigidity as measured by the R Scale was a trait with sufficient generality to manifest itself in a situation involving interpersonal relationships.

In an attempt to investigate this problem, a "spontaneity test" situation was used. The subject had to assume the role of a salesman and try to sell

Christmas cards to a skeptical, reluctant buyer. The behavior was recorded on tape and submitted to a set of judges who had been trained to evaluate the degree of rigidity displayed in the situation. Ratings of each subject were made on a seven-point scale with an inter-rater consistency of .89 as measured by the Hoyt analysis of variance technique. At the completion of the behavioral test (approximately five minutes), an estimate of the previous selling experience was obtained, and then the subjects took two paper-pencil tests, the Sentence Fluency test and the Similes test. The subjects were males selected from the undergraduate classes at the State University of Iowa on the basis of their scores on these scales: All scored in the middle 60 percentile on the Anxiety Scale and below the 90 percentile on the L Scale. They scored either beyond 80 percentile or below 20 percentile on the Rigidity Scale. Four groups were randomly constructed and the thirty-six Rigid subjects were randomly assigned to two experimental conditions: anxiety stress and neutral instructions. Similarly the thirty Flexible subjects were randomly assigned to these two experimental conditions. The four groups thus obtained were equally verbally fluent as measured by two verbal fluency measures.

Results were as follows:

(1) No relationship was established between performance in the "spontaneity test" as determined by rates and performance on the paper-pencil inventory, the Rigidity Scale. This was investigated by analysis of variance. The *F*'s were not significant either for the "rigidity" condition or the anxiety instructions condition.

(2) The mean ratings of those who had had selling experience was significantly lower than the mean ratings of those who had not had this specific type of experience. Some of the variance in the ratings, therefore, may be accounted for in terms of specific type of previous experience.

(3) The Sentence Fluency and Similes tests correlated positively with the ratings of rigidity in the behavioral situation. The product moment coefficients were .26 (significant  $< .05$ ) and .37 (significant  $< .01$ ), respectively. However, these two variables were found to be uncorrelated with the Rigidity Scale according to Biserial correlation from widespread classes.

The results, in general, indicated that the Rigidity Scale does not measure a trait with sufficient generality to separate the individuals in the extremes of the distribution on rigidity displayed in a complex behavioral situation. Although the precise degree of generality has not been determined, at least it casts doubt on the labeling of this scale an unqualified measure of manifest rigidity. Three hypotheses possibly accounting for the lack of

relationship between the R Scale and the judges' ratings from the spontaneity situation were discussed. First, the difficulty may lie in the criteria against which the rigidity scale items were chosen. That is, they were not selected in terms of differences between rigid people and non-rigid people but rather on what clinicians thought rigid people would say about themselves on a true-false type of inventory. Even though this method of scale construction had been used successfully by Taylor (32), it is possible that the difference in the variables themselves may have been crucial. That is, anxiety with its drive properties being general in its effect and rigidity as a habit tendency being specific. In addition it is possible that the defensiveness of the subjects may have distorted the descriptions of themselves on the R Scale items. That is, they may not have been honest or insightful.

The concept of rigidity of behavior as measured by many of the so-called tests of rigidity may not bridge the gap between the rigidity exhibited in particular tasks and the rigidity as a pervasive trait in the personality. If there is such a thing as general rigidity in the personality structure, our tests and measures of behavioral rigidity have to be investigated more thoroughly and varied systematically before we have instruments which are sufficiently dependable for future research in personality development and dynamics.

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# A STUDY OF VALIDITY AND CONSTANCY OF CHOICES IN A SOCIOMETRIC TEST\*

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## *Problem*

The purpose of this study is to investigate the constancy of choice behavior as expressed on Moreno's sociometric tests and in a life situation. The degree to which observed choices in the life situation agree with reported choices on the sociometric test, when the criterion of choice is held constant, may be considered a measure of validity. In an effort to determine the degree of change in choice behavior that is known to occur over a period of time, the original sociometric test was readministered shortly following the observation of choosing in the life situation. Lack of validity would be indicated by a change greater than that expected and measured by the test-retest method.

## *Background and Setting of the Problem*

The Moreno test has found extensive and intensive use in the fields of sociology, psychology, and education. Its fundamental purpose is to measure the social structure of a specified group. The sociometric test accomplishes this by requiring each individual of a specified group to select one or more individuals in that group on the basis of a stipulated criterion of choice. The standard method of obtaining choices in a sociometric test is the question-and-answer method (i.e., the individuals are asked to name their choices). These choices are usually written by the individual or, in cases of young children, may be written by the experimenter. Thus, by simply counting the total number of choices each individual receives from the other members of the group a rank order can be obtained and each individual's relative position in that group may readily be ascertained. This is the basis of the group structure in sociometric studies.

The basic structure may be subdivided into groups of individuals on the basis of the number of choices received. Those individuals who receive the largest number of choices have been designated as *leaders*, *stars*, *most-chosen*, and *most-accepted*. Individuals receiving few or no choices have been called *isolates*, *unchosen*, *rejected*, *least-chosen*, and *least-accepted*. These names refer only to their sociometric status and may or may not agree with other

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\* This study was made in connection with a research project being carried on under a grant from the Research Council of Florida State University.



behavioral criteria. One should use caution when using these terms to describe an individual as they are always relative to the group measured and the specific choice criteria used to determine the status. The status of an individual may also change and so an individual who is classified as an isolate on one sociometric test may not be so classified on another test or on the same test at a later date. It is important then to be able to know the degree of stability in sociometrically determined group status.

The following experiment was designed to investigate the validity of a sociometric test as measured by the degree to which observed choices agree with reported choices when the criterion of choice is held constant. In an effort to determine the expected degree of change in choice behavior the original sociometric test was readministered shortly following the observation of choosing in the life situation.

### *Subjects*

The subjects used in this experiment consist of twenty seven pupils in the fourth grade class of the Florida State University Demonstration School. All subjects used in computing data were present at the administration of the sociometric tests.

### *Methodology*

1. A sociometric test was administered to determine the group status. This test was of the paper and pencil type and the pupils wrote down their choices "privately." A single criterion of positive choice was used. No limit was set on the number of choices that could be expressed.

2. The subjects were next given the opportunity to make their choices in the life situation using the original choice criterion. On the basis of these choices group status was determined as in the sociometric test.

3. After all the subjects had expressed their choices in the life situation the original sociometric test was readministered and group status again determined.

### *Procedure*

Prior to administration of the first sociometric test the examiner was introduced to the class and with the help of the teacher discussed some of the things the children liked to do. Although the selection of presenting short psychodramas had been pre-selected by the examiner the suggestion of "doing some plays" came from the children themselves. The class then discussed some of the mechanics and manners that would be necessary for such plays. It was decided that the plays could be presented in the classroom with those not participating to act as an audience.



### Situation I—The Sociometric Test

The examiner asked all the children to indicate the persons they would choose to be in their play.

When you give your play what classmates would you like to have in it? I want you to write down their names because you know them much better than I do. You may choose anyone you like and as many as you like. Write their names on the piece of paper you have. Miss B—— or I will help you spell any names you need help with.

After the papers had been collected they were told:

You can be thinking about the play you would like to give. It may be about something you have done, something you are going to do, or about something you would like to do if you had the chance. It isn't necessary to write it all out but know what you want to do in case your turn comes first.

No further mention was made of their original choices.

### Situation II—The Life Situation

After an interval of four days the dramas were presented at the average rate of two per one hour session; two sessions per week. No sessions were held when there were absences. Each child in turn was asked his choices privately by the examiner in order to obtain a higher degree of individual spontaneity and to avoid influence of a few individuals who exhibited obvious signs of wanting to be chosen in every play. No child with the exception of the last few knew when his turn would come.

After the choices were given, the examiner read off the names and those individuals chosen met in the corner of the room where the theme of the play and assigning of roles were given by each child who did the choosing. The play was then presented to the class. This procedure extended over an interval of eight weeks.

### Situation III—The Sociometric Retest

One week after the last drama was presented a second sociometric test was given. The children were told they would have an opportunity to give another play. The original sociometric test procedure was then repeated.

### Results

The choices made in all three situations are presented in Table 1. The subjects are listed in rank order of choices received on the first sociometric test in Situation I. The vertical columns contain the choices received. The horizontal rows contain the choices expressed. The numbers 1, 2, and 3

TABLE 1  
THE EXPRESSION OF CHOICES BY A FOURTH GRADE IN THREE  
SITUATIONS HAVING THE SAME CHOICE CRITERION

		Choices Received																										Total Choices Expressed				
		Pupils																										Situation				
		AA	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	I	II	III	
Choices Expressed	AA		3	123		3	123	123	23	1		1	3	123		123				12										8	7	4
	A	1	3			1	3						23		3			2	23			3	23						3	4	8	
	B	123	123			1	3	23	123	2	1		2	23				2											4	8	4	
	C	1	3	123				1	2								1	2	3										23	6	5	4
	D	23	23	23			123	2		2			123	1						2	1								23	4	8	5
	E	123	2	2		123		123	1	23			2					2	1										5	8	4	
	F	12	1	123		2	23		23	23		123	23	12						23									5	10	7	
	G	2	1					1	3			1	3	2	23							2	2						3	5	3	
	H	123	12			23	23					2	1	3			1												4	5	4	
	I	1	3	1	3	12			1	3		3	1	3		123	123	3	3	3					3	2	10	4	12			
	J			3		1	3	2	1	3	123							12										7	4	1		
	K	123	3	1	3	2	23		23		1	3						12										6	5	4		
	L	123	23	23								1	3			23	2				3			2				4	6	4		
	M	1	3	123	123		23	123	3		1		123		2													10	6	7		
	N	123	23	1	3		3		123	1	2		23										2					5	7	6		
	O	1	3	123	123		23				2	23									23					2		5	7	7		
	P	1	3	123			1			23		3			2										123			6	5	5		
	Q	123	23	23		23	2	12			23	23																4	8	6		
	R	3	3	1	3	123	1			3		3	1		2	2		123	2								2	6	6	7		
	S		123						123			1	3					123		12					123	23		9	6	6		
	T	1	3	123	3			23					2											3				4	3	5		
	U	3	23	3	3				12			1	2	1	123		23											6	5	6		
	V	1	3	1	23			123		2		3				123				3			2					5	5	7		
	W	1	12	2	23		1			1				3		2			2	3		2				3	3	6	5	5		
	X	1	3	123	1	2	2			12	2			2						1	3	3						5	6	5		
	Y	123	23	2		2	3			3	8	3			23	2							2					3	7	7		
	Z	123	23	123						123		1	1		123				3			1	3					12	5	7		
Total Choices Rec'd	I	21	19	15	11	9	9	7	6	6	6	6	5	5	4	3	3	3	3	2	2	1	1	1	1	0	155					
	II	12	18	14	5	11	9	8	3	6	9	4	10	2	4	4	4	7	11	1	1	4	2	4	2	3	14		160			
	III	21	20	15	6	10	10	6	4	5	6	6	11	5	3	4	2	5	4	2	4	4	2	2	2	3	1	3		166		

indicate the situation in which a choice was expressed. For example, pupil AA chose pupil B in all three situations. These choices are indicated by 1-2-3- under B's name. Since B also chose AA in all three situations these choices are indicated with 1-2-3- under AA's name. Individual totals in each situation, of choices received, and choices made are indicated.

### Constancy of Choice Expression

The total number of choices made by the group are: Situation 1, 155; Situation II, 160; Situation III, 166. As a group the *number* of choices made tends to remain constant over a two month period.

In order to determine the extent to which the subjects choose the *same* individuals in any two situations a ratio was computed between the number of choices repeated in any two situations and the total number of choices expressed by the group in one of those situations. These results are presented in Table 2.

TABLE 2  
CONSTANCY OF CHOICE EXPRESSION AS MEASURED BY REPEATED CHOICES

Situation*	Total Number of Choices Made by Group	Choice Repeated		
		In Situation	Number	Percent
I	155	II	73	47
I	155	III	89	57
I	155	II & III	58	37
II	160	I	73	46
II	160	III	93	58
II	160	I & III	58	36
III	166	I	89	54
III	166	II	93	56
III	166	I & II	58	35

\*Situation I—Sociometric Test  
Situation II—Life Situation  
Situation III—Sociometric Retest

Of 155 choices expressed in the original sociometric test (Situation I) 73 (47 percent) were reexpressed for the same individuals in the life situation (Situation II). Of 155 choices expressed in Situation I 89 (57 percent) were reexpressed for the same individuals on the readministration of the sociometric test (Situation III). Of 160 choices expressed in the life situation 93 (58 percent) were expressed for the same individuals on the sociometric retest. Of 155 choices on the original sociometric test 58

(37 percent) were expressed for the same individuals in *both* the life situation and the sociometric retest.

These figures show that as a group about half of the choices expressed are for the same individuals from one situation to another regardless of whether they are written on paper or expressed in a life situation. This would suggest that the choice criterion was not psychologically different between the two situations as reflected by the group. How does this change in expression of choices affect the group status?

### *Constancy of Choice Status*

In order to measure the degree of constancy of the group status from one situation to another the Spearman Rank-Difference correlation method was used.\* Tied scores were given a common rank equal to the mean of the ranks involved. The coefficients found are as follows:

Situation I and II	Rho = .76 ± .09
Situation II and III	Rho = .80 ± .08
Situation I and III	Rho = .89 ± .04

If a *t* ratio of 2.0 is allowed then these three coefficients are not statistically significantly different. The coefficient of  $.89 \pm .04$  between the sociometric test-retest is relatively high. It also reflects the change in choice behavior we might expect from the changes observed in the expression of choices. Group status cannot change unless individuals change in their expression of choices. However, it is conceivable and likely that status is more stable than expression of choices. Leaders tend to remain leaders even though their choosers may vary. No attempt is made to demonstrate this hypothesis in this study.

It was stated that in order to measure validity of a sociometric test by observing the choice behavior in the life situation one must be prepared to measure the expected change in choice behavior that would occur during the interval between measurements. If the correlation between the sociometric test-retest is taken as a measure of this change then any increase in change in choice behavior due to lack of validity would tend to lower the coefficients of correlation between the sociometric tests and the life situation. It can be

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\* This method yields a coefficient designated by the Greek letter rho. For all practical purposes it is equivalent to the Pearson *r*. In no case does *r* exceed rho by more than .018. For the formulae and computation of rho and its standard error see J.P. Guilford, *Fundamental Statistics in Psychology and Education*, McGraw-Hill 1942, p. 227-231.

seen that these are lower but, as stated, not significantly so. This data suggests that there is little indication that change in choice behavior as measured by a sociometric test is due to lack of validity in the test. The greater part of the change is probably due to the dynamic aspect of choice behavior *per se*. This study should only be considered as exploratory. Only one group of children and one choice criterion were used. Further study is needed using other choice criteria and other groups differing in degree of cohesion before more decisive conclusions regarding the validity of sociometric tests are reached. Other methods of measuring validity that are not influenced by the intrinsic change should be investigated.

### *Summary and Conclusions*

This study investigates the constancy of choice behavior as expressed on Moreno tests and in a life situation using the same choice criterion. This method is offered as an approach to the study of validity in sociometric tests. The sociometric test was readministered after choices were expressed in the life situation to determine the degree of expected change in choice behavior. The results of this study suggest that when a choice criterion has real meaning to the subjects, the degree of change in choice behavior between a sociometric test and a life situation is not significantly greater than that which occurs between a sociometric test and later readministration of the same test. The writer feels that the results of this study support the hypothesis that a sociometric test is valid insofar as the choice criterion has reality value for the subjects.

# A COMPARATIVE SOCIAL CLASS ANALYSIS OF SAN JUAN SUR, AND ATIRRO, COSTA RICA

## A SOCIOMETRIC STUDY

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The analysis of the social class structures of San Juan Sur and Atirro was made in conjunction with a sociological and anthropological comparative community study that was conducted with reference to a major variable—land tenure. These two particular communities were selected inasmuch as they displayed the characteristics most ideally suited for the purposes of making a comparison such as relative isolation, size, physical characteristics, and purity of type.

Both communities, being somewhat isolated, are comparatively free from the influences of neighboring localities. From the standpoint of families, both are comparable—sixty families in Atirro and seventy-five families in San Juan Sur—and large enough to permit certain statistical manipulation of the data. Physical characteristics of the two tend to fall within the middle range when compared with the other rural settlements found in the Turrialba region of Costa Rica.

Atirro is completely an hacienda type community with the entire settlement situated upon and owned by one large hacienda. San Juan Sur is a peasant farmer type community with the majority of families dependent completely or in part upon the production of their small land holdings.

The purpose of this inquiry was to determine the extent to which a class structure exists, the nature of it, and the manner in which it varies for the two different type communities.

As evidenced from an analysis of the interpersonal relations of those living within the two communities the large majority of the families cluster into distinct clique groupings within which there is exhibited a considerable amount of social interaction. The number of relationships existing between these groupings is decidedly less, in most instances, than that occurring within, thus indicating the existence of cleavages. The extent to which these cleavages exist varies with the different clique groupings.

Insofar as social classes are considered as groups of individuals between whom there exist barriers to intimate association, but within which there occurs considerable social interaction of this type, the evidences provided from an analysis of the informal social structure of the two communities



would appear to reveal the presence of a stratified social organization in each.

The importance of an analysis of the interpersonal relations of the people as an essential criteria in describing the social class structure is indicated by Warner who in his Newbury Port Study<sup>1</sup> found that a man's social class is determined by the company he keeps—that is, by his participation or association groups as reported by his acquaintances. This is in accord with Moreno's hypothesis<sup>2</sup> of the primary significance of man's acquaintance and sociometric matrix.

Loomis found in his sociometric studies that kinship and friendship groupings (cliques) are composed of individuals of approximately the same social status.<sup>3</sup> Warner and Lunt in their study of Yankee City discovered that next to the family, the members of a clique are most likely to become members of the same social class. Although the differences in class status among members of a clique are more pronounced when compared with the family, the cliques themselves draw fairly sharp class lines.<sup>4</sup> In Yankee City, while the large majority of the families had but one class represented in their membership,<sup>5</sup> the clique participation tended to be in one or two classes.<sup>6</sup> Their study revealed that clique membership ordinarily held an individual in his own class, or permitted relationships with a class above or below.<sup>7</sup> They found, however, that cliques do allow upward mobile people to form intimate associations with those above them and thereby improve their chances of climbing.<sup>8</sup>

*Methods employed.* From the foregoing, the importance of analyzing interpersonal relations as an essential criteria in describing social class status in a community is indicated. Although the statuses of those families occupying varying positions in the hierarchical class structure depend upon a series of factors, it has been observed that persons of similar social status in most cultures, carry on informal visiting or other types of social activities

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<sup>1</sup> W. L. Warner, M. Mecker, and K. Ells, *Social Class in America* (Chicago: Science Research Associates, Inc., 1949).

<sup>2</sup> J. L. Moreno, *Who Shall Survive?* Beacon House Inc., New York, p. 137-57, 1934 and 1952.

<sup>3</sup> Charles P. Loomis, *Studies of Rural Social Organization in the United States, Latin America, and Germany* (East Lansing: State College Book Store, 1945), p. 386.

<sup>4</sup> W. Lloyd Warner, and Paul S. Lunt, *The Social Life of a Modern Community* (New Haven: Yale University Press, 1941), p. 90.

<sup>5</sup> *Loc. cit.*

<sup>6</sup> *Ibid.* p. 353.

<sup>7</sup> *Ibid.* p. 355.

<sup>8</sup> *Loc. cit.*

in clique or congeniality groupings composed of persons of approximately the same social status.<sup>9</sup>

In order to describe the class structure of the two communities considered in the present analysis, therefore, two Moreno<sup>10</sup> techniques, the Sociometric Test and the Sociogram, were utilized in order to determine the actual patterns of social interaction. After a year's acquaintanceship, the social class structure could have been described from a knowledge of the people gained through continuing association but being concerned with more objective and operational methods which might be utilized elsewhere, sociometric techniques were employed to reveal the status groupings existing within the two communities.

While friendly visiting and other informal social activities tend to be participated in largely by those who consider themselves and are considered by others to be equals, thus serving as an operational means of ascertaining whether or not social classes exist, they do not serve to indicate which of the larger groupings (social classes) are ranked by the members of the community in socially superior and inferior positions, which is an essential part of the concept of social class.

In an effort, therefore, to ascertain which of the families and friendship groupings occupied the different levels in the hierarchical class structure, and from a knowledge of the families living in the two communities, as nearly as possible an equal number of competent judges were selected from each of the social classes existing in the two settlements.

A total of ten judges were selected from each community. These persons, separately and privately, were given a set of cards covering every family in their community. Upon each card appeared the name of a family jefe (head) along with that of his esposa (wife). In the event that the jefe had no mate, the one name appeared. Upon occasions, the judge's wife or husband was present and at such times the resultant rating was usually the summation of their combined judgments. In such instances the names of both individuals were placed on the rating sheet.

After a preliminary explanation had been made as to what was desired, each judge was asked to go through the cards and sort them into as many different basic social groups as he or she felt existed in the community and to indicate the position of these groups in relation to the rest.

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<sup>9</sup> Charles P. Loomis, *Studies in Applied and Theoretical Social Science* (East Lansing: Michigan State College Press, 1950), p. 90.

<sup>10</sup> *Who Shall Survive?* p. 11 and p. 26.

After the judge had completed the procedure, he was asked to check through the cards again in order to insure proper placement of each family.

After each judge had classified the people of his community into what he considered was their proper grouping and had also identified himself in the classification, the ratings were placed on his rating sheet containing the complete list of names appearing on the cards. The bottom social group in each instance was considered as class 1 with the number of the group increasing as it moves upward through the hierarchical class structure. It is of considerable interest to note that the ten judges in each community were all in remarkable agreement as to the number of classes that existed in their locality.

It is of further significance to note that in Atirro eight of the ten judges placed themselves into the same social class in which they were placed by the majority of the other judges. With reference to the other two, one judge, a clique leader, rated himself as being in the second class. In this particular instance, however, the family is actually upward mobile as is indicated by the fact that three of the judges besides himself placed him and his family into this group, while the other six indicated him to be a member of the bottom class.

The other case in question is rather singular in that five judges placed this judge and her family in class three, four judges (including herself) placed the family in class four, while the tenth judge placed them half-way between classes three and four with the explanation that the marriage was unequal. The wife, a relative of the finca (farm) owner, belonged definitely in the fourth class, but her husband, according to this judge was distinctly of the third class, and because of this he could never consider the family as being quite equal to that of the finca owner.

In San Juan Sur, nine of the ten judges placed themselves in the same class into which they had been placed by the majority of the judges. The tenth judge, family No. 41, who is the foremost clique leader in the community, placed herself in the third class while the other nine judges placed this family into the second class.

The ratings of the various judges are graphically indicated in Figures 1 and 2. As indicated by the legend, those families who were designated by all ten judges of the community to be of class one (the lowest class) are solid black. The extent to which any family circle is filled in with a specific class marking represents the proportion of the judges placing the family within a particular social class. Thus, for example, Family No. 60 appearing in Figure 2 was placed by six judges in the bottom class and by four judges

in class two. Number 38 of the same Figure was placed in class three by eight judges and in class two by the other two judges.

In the Latin American countries, the strongest barrier to intimate association existing between the different social classes is that surrounding marriage. There is tremendous pressure exerted, particularly among those of the upper classes, against marrying beneath one's own class. This barrier to intermarriage between the different classes becomes less stringent as one moves down through the various classes in the hierarchical structure.

Inasmuch as intermarriage tends, therefore, to be a crucial test as to the existence and strength of social classes, an analysis of this phenomena was effectuated in conjunction with the sociometric and rating techniques.

As each of the ten judges in both communities terminated the process of classifying the families into the various classes which they felt existed within their community, they were asked, "Now, let us suppose for a moment that you have a daughter who is about 17 years old and ready for marriage, into which of these groups of families would you like to see her marry for her happiness?" After the judges had done this, they were asked why they had made this selection. Following this answer, they were next asked to state why they had not selected one of the other classes, which they had previously indicated to be existent in the community. All answers as well as other pertinent comments were recorded verbatim as nearly as possible on the backs of their rating sheets.

#### ANALYSIS OF VISITING RELATIONS ACCORDING TO SOCIAL CLASS AS INDICATED BY THE JUDGES' RATINGS

Informal visiting has been selected as the type of social relationship most significant in revealing the actual interaction patterns in which families of similar social status participate. That visiting behavior on the whole is class typed, particularly among kinfolk, has already been indicated by Warner and Lunt in their studies.<sup>11</sup>

*Atirro.* An analysis of Figure 1 reveals that the social structure of Atirro is comprised of four classes with the large majority of the families, 47 or 78.33 per cent falling into the bottom group.

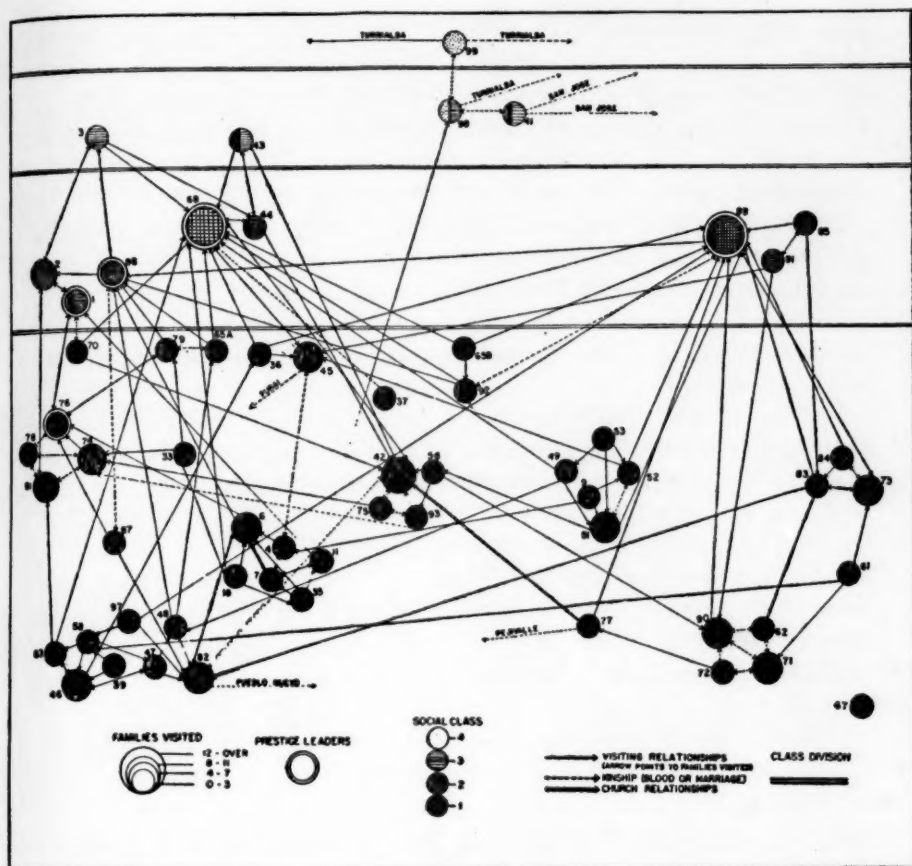
It is of especial significance to note that the two chief prestige and clique leader families occupy higher status positions in relation to the large majority of their clique followers. This would appear to agree with Sherif's findings, that out of the informal interrelationships occurring among the members of

<sup>11</sup> Warner and Lunt, *op. cit.* p. 90.



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SOCIOGRAM I  
VISITING RELATIONSHIPS OF THE FAMILIES IN ATIRRO, COSTA RICA  
ACCORDING TO SOCIAL CLASS

the newly formed clique there arises a group structure with relative positions and leader-follower relations. The various members of the group occupy varying statuses in the structure with each exercising influence in proportion to the particular status he holds. In each clique the leadership tends to come from those holding the relatively higher status positions and the followers from among those of lesser status.<sup>12</sup>

Family No. 68, who is the most influential leader of the two, is the

<sup>12</sup> John H. Rohrer, and Muzafer Sherif, *Social Psychology at the Crossroads*. (New York: Harper and Brothers, 1951), pp. 388-424.



more firmly established in class two as is indicated by the homogeneity of the circle markings indicating that all judges were agreed as to his position in this group. Family No. 88, on the other hand, still retained some markings of the first group, though the majority agreed that it rightfully belonged in the second class. It is of interest to note that two other prestige leaders, one of which is a clique leader as well, are members of class two.

The small clique comprised of the finca owner, the commissary owner, and the commissary owner's father, is divided between class three and four with the finca owner family firmly established at the top of the class pyramid. The only other two families in these two top classes are those of the finca accountant and the family in which the jefe is a furniture maker, and his wife a school teacher.

As is indicated by the social class markings in the family circles, the majority of the families in Atirro evidence little or no social mobility. This condition is largely peculiar to the bottom class in which 33 or 70.21 per cent of the 47 families evidence no upward movement in class status while 9 of the remaining families indicate only a small degree.

While all but one family (No. 68) in social class two evidence some markings of class one, only two of these, family No. 1 and No. 86 evidence upward mobility into class three. It is of interest to note that these two families are those of the finca foreman, and the foreman of the coffee processing mill.

Family No. 43, that of the furniture maker and his school teacher wife, occupies a position of relative prestige among the peons of the finca and has been placed into class three. In spite of this, however, their campesino background is evidenced in the class two markings appearing in the circle. As previously indicated, family No. 98 is not considered to be of equal ranking with family No. 99 by reason of an unequal marriage.

In order to evaluate the extent to which the four classes are in-groups, observed frequencies of visiting within and between the classes have been compared with frequencies which might be expected to result from a purely random selection, assuming that if there were no cleavages, the total number of visiting relationships would be divided among the different groupings in proportion to the number of families in the groups.<sup>13</sup>

As revealed from an analysis of Table I, the families of class one made a total of 126 visits, 92 of which were to other families within their groupings. When this is compared to the 98 visits which would be expected if a process

<sup>13</sup> Charles P. Loomis, *Studies of Rural Social Organization in the United States, Latin America, and Germany* (East Lansing: State College Book Store, 1945), p. 118.



of purely random choice were in operation, proportionately speaking, there is no apparent in-group relationship evidenced within the class.

While it would be expected from chance selection that 16 visits would be made into class two by those of class one, 33 such visits were actually

TABLE I

OBSERVED AND EXPECTED INTER AND INTRA-CLASS VISITING OF THE FAMILIES LIVING IN ATIRRO, COSTA RICA

Direction of visit	Observed number of visiting relations	Expected number of visiting relations
1. Class one to class one	92	98
2. Class one to class two	33	16
3. Class one to class three	1	9
4. Class one to class four	0	3
5. Class two to class one	13	17
6. Class two to class two	7	3
7. Class two to class three	2	2
8. Class two to class four	0	0
9. Class three to class one	1	6
10. Class three to class two	5	1
11. Class three to class three	1	1
12. Class three to class four	1	0
13. Class four to class one	0	1
14. Class four to class two	0	0
15. Class four to class three	1	0
16. Class four to class four	0	0

indicated. The number of visits from families in class one to those in classes three and four are limited to 1, while 12 would be expected. From this it may be observed that while class one does not in itself especially comprise an in-group with respect to visiting behavior, a degree of cleavage does exist between this class and classes three and four. When classes one and two are considered as a unit, there are evidences of the existence of an in-group. This is in substantial agreement with Warner's statement, "Clique membership ordinarily held an individual in his own class or permitted relations with a class above or below."<sup>14</sup>

When analyzing the visiting behavior of those in class two, definite in-group relationships are evidenced in contrast to class one. Three visits were theoretically expected within the class, while in actuality there were 7. It

<sup>14</sup> Warner and Lunt, *op. cit.* p. 355.

is of interest to note that although 17 visits of this group were expected to go to those families in class one, only 13 such visits actually occurred indicating the presence of some cleavage with reference to downward visiting.

The families in class three indicate no significant in-group relationships with one observed visit occurring within the group, and one visit being theoretically expected. The major associations of these families are with those in class two. There are five such relationships observed while only one was expected. The visiting by families in class three to those in class one was, to the contrary, however, much less (1 visit), than that expected (6 visits).

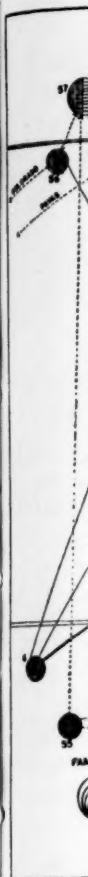
There were no visits expected within class four in the community because of the fact that only one family held this status position. This family was theoretically expected to visit in class one by virtue of the fact that 78.33 per cent of the families in the community are found in that class. Actually, however, it visits only one family in the settlement which is in class three. This is a reciprocal visiting relationship occurring between the finca owner and the commissary owner families. The in-group association of the finca owner family is best indicated by their two visiting relationships in Turrialba. This family is a member of a clique comprised of persons having similar social status and their major informal associations are with those of this group, and not with the families of the finca.

In analyzing the visiting patterns of those families in each of the four classes, the observed associations proportionately were very largely within two classes with very little visiting being carried on by those families separated by one or more intermediate strata. An analysis of visiting patterns of the four classes evidences generally a large amount of upward association from class one to class two, but with very little upward visiting (4 visits) between these two classes and those above.

This visiting from class one to two is explainable in that the two central clique leader families (68 and 88) are in class two and are visited by their followers who are largely in class one.

*San Juan Sur.* An analysis of Figure 2 reveals that the social structure of San Juan Sur is comprised of three classes, with the largest group falling into class two. Forty-four or 58.67 per cent of the settlement's total number of families fall within this class. Of the remaining families, 18 or 24.00 per cent are in class one and 13 or 17.33 per cent are in class three.

Of the four top clique leader families in the community, (41, 34, 72, 57) three are found in class two and one is in class three. It is significant to note that when the markings in the circles of these four families are com-



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At the very bottom of the class hierarchical structure are two families, No. 6, a very poor peon family and No. 55, an old man who lives by the charity of others, sometimes begging in Turrialba for food. At the top of the social class pyramid are three families, No. 66, Maximino, a prosperous farmer and the top prestige leader of the community, No. 32, Eduardo, the

English storekeeper who owns and operates the general store in addition to possessing a small finca, and No. 24, the family who owns the largest finca in the community. All three of these families are not only prosperous but long-time residents of the community and highly respected by their neighbors.

These three families at the top of the class pyramid as well as the two previously mentioned who are at the very bottom of the structure were unanimously ranked into these classes.

A review of the markings in the circles representing the families of the community will reveal an open class system with considerable mobility between the class groupings. The only two families in class one who indicated absolutely no upward mobility, are the two previously discussed—No. 6 and 55. In the middle class (number two), the mobility is even more evident with every one of the 44 families evidencing a greater or lesser degree of movement.

In the top class (number three) only 3 of the 13 families (66, 32, and 24) gave evidence of being completely established within the grouping. In order to evaluate the extent to which the three classes form into in-groups, the observed frequencies of visiting have been compared with those that might be theoretically expected to occur if selected purely by random choice.

The analysis of Table II reveals that of the 46 visits made by families in class one, 22 were observed as occurring within the class itself, while only 11 visits were theoretically expected, thus evidencing significant in-group relationships.

There were 21 observed visits to those of class two while 27 visits were expected. Instead of the 8 theoretically expected visits to families in class three, there were only 3. As indicated by a comparison of the observed and expected frequencies there is a greater tendency toward in-group cleavage between classes one and three than between classes one and two.

If one hypothesizes that the families of class one direct their visiting relations without reference as to whether or not the families visited are of class one, two, or three, and that the visiting relations of those in class one are distributed among all three classes in proportion to the number of families in their grouping, one may compute the chi square<sup>15</sup> for the visiting relations of class one families to class one families, and combine this with the chi square of the visiting of class one families to class two and three families. Since the resulting chi square value of 14.457, (1 degree of freedom) in this instance indicates that less than one time out of one hundred

<sup>15</sup> The chi square test was not applied as a measure of in-group cleavage for the data of Atirro because the numbers were too small to be meaningful.

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TABLE II  
OBSERVED AND EXPECTED INTER- AND INTRA-CLASS VISITING OF THE FAMILIES LIVING IN  
SAN JUAN SUR, COSTA RICA

Direction of visit	Observed number of visiting relations	Expected number of visiting relations
1. Class one to class one	22	11
2. Class one to class two	21	27
3. Class one to class three	3	8
4. Class two to class one	7	29
5. Class two to class two	80	70
6. Class two to class three	32	20
7. Class three to class one	1	9
8. Class three to class two	23	22
9. Class three to class three	14	6

the observed results would have been obtained from a sample of this size used if the hypothesis were true, one has a basis for its rejection and can assume that insofar as this basis of comparison is meaningful, a definite cleavage between families of class one and families of classes two and three exists.<sup>16</sup>

When the visits made by those in class two are analyzed it is revealed that here again there is evidence of an in-group relationship with 80 visits observed within the class compared to a theoretical expectancy of 70 visits. It is of significance to note the marked lack of downward visiting by the members of this second class. While 29 such visits were to be expected only 7 occurred. To the contrary, there was considerably more upward visiting than expected by random choice with 32 visits observed in comparison to the 20 expected. When a chi square is computed as a measure of the cleavage existing between families in class two, and families in classes one and three, a chi square of 3.512 is revealed indicating the existence of an in-group cleavage, although it is not as marked as that of class one.

The visiting of families in class three indicates again the presence of an in-group, with a definite cleavage existing between this class and classes two and one. While there were 6 visits expected with reference to visiting within the class, 14 actually occurred. To the contrary, there was only one visit observed by a family in class three to a family in class one, instead of 9 such visits theoretically expected.

<sup>16</sup> Charles P. Loomis, "Political and Occupational Cleavages in a Hanoverian Village, Germany," *SOCIOMETRY*, IX (November 1946), 123-321.



The application of chi square here as a test of cleavage between families in class three and those in classes one and two reveals a chi square of 12.248 (1 degree of freedom) which indicates a marked in-group cleavage.

An analysis of the visiting patterns for the three classes reveals that in each instance when observed and expected frequencies are compared, a disproportionately large amount of visiting is to other families within their own class, indicating the presence of an in-group. This is supported by the application of chi square as a measure of cleavage. The chi square of all three classes indicated the presence of in-group cleavages with reference to the other classes.

With class one manifesting the greatest in-group cleavage of the three, followed by class three, the large majority of visiting outside the class is to families in adjacent groupings, either above or below. A further analysis of the visiting patterns of families comprising the three different classes reveals a general upward trend in the clique associations. The families in class two, who are the only ones having the opportunity of visiting both up and down evidence a marked proclivity towards upward contacts and a definite disinclination to visiting below their class level.

*A comparison of the social class structures of Atirro and San Juan Sur.* A comparative analysis of the social class structure of the two communities, as indicated by the judges' ratings, reveals that in Atirro, the large majority (78.33%) of the families are in the bottom class (class one) while in San Juan Sur approximately one-fourth (24.00%) fall into this grouping. Class two in Atirro is the second largest grouping in the community, yet it contains only 13.33 per cent of the families. In San Juan Sur, to the contrary, this is the largest of the social classes containing the majority of the community's families (58.67%).

A comparison of class three indicates that while 6.67 per cent of the families in Atirro are of this grouping, the percentage in San Juan Sur is 17.33 per cent. The fourth class in Atirro consists of only one family (1.67%)—that of the finca owner. This grouping cannot be compared with San Juan Sur inasmuch as the social class structure of that community is comprised of only three classes. As the analysis has revealed, the families in San Juan Sur generally, occupy a higher class status than do those in Atirro.

In Atirro, the fourth class and one-half the third class, are accounted for by the finca owner, commissary owner, and commissary owner's father who, as has been consistently indicated throughout the study, are largely detached from the others of the community in their social contacts. In Atirro the people referred to the fourth class as composed of "gente poderosa," or



"capitalistas," to those of classes three and two as "los de tercero" and "segundo categoria," and to those of class one as the "pobres," or "peons cualesquieres."

In San Juan Sur, those of the top grouping (class three) were referred to as "los primeros" or "los alticos," while those of class two were considered to be "los regulares" or "el grupo mediano" and those of class one as "el grupo de los bajitos" or "los bajitos del pueblo."

In both of the communities, the major prestige and clique leaders generally occupy higher status positions than their followers. As indicated by the markings in the circles, four of the five major prestige leaders in Atirro are found in class two, while in San Juan Sur, four of the five are in class three. Although the clique leader families (when they are not the same as the prestige leaders) do not usually rank as high in the class structure as the prestige leaders, a comparison of their status markings in relation to those who visit them, indicate that generally, they occupy a somewhat superior status with reference to those in their clique groupings.

As is further indicated by the markings in the circles, resulting from the judges rankings, there is relatively little social mobility between the different classes in Atirro, while there is evidence of considerable mobility in San Juan Sur. In Atirro, the judges were in unanimous agreement as to the class status of 70.21 per cent of those in the bottom class with the same unanimity being manifested with reference to the rating of the family in class four. The majority of the mobility evidenced in the community was among those of the two middle classes—two and three. In San Juan Sur, as illustrated by the sociogram, the large majority of the families in all three classes evidence class mobility to a large degree.

When the visiting patterns of the families in the different class groupings are analyzed it is determined that in Atirro the only group manifesting a significant in-group cleavage with reference to visiting relations is class two. This is in contrast to San Juan Sur, where all three classes evidenced significant in-group cleavages. In both communities, Warner's findings that clique participation tended to be in one or two classes, applies, as is indicated by a review of the visiting patterns of each of the classes.

It may be noted that in Atirro the preponderant majority of all upward association is from those families in class one to their leaders in class two. As revealed by an analysis of the visiting patterns of the families in class one, there was no in-group cleavage with reference to those of class two. There is little upward visiting between the families of classes one and two and those above. In San Juan Sur, on the other hand, where there is evi-

denced significant in-group cleavages with reference to the visiting patterns of all three classes there is, nevertheless, considerable association between the classes as illustrated by the sociogram. It may be noted, for example, that while in Atirro only one association passes up through two classes, there are four such relationships occurring in San Juan Sur.

The relative lack of significant in-group cleavages in Atirro may be partially explained by the high degree of mobility and a comparatively rapid rate of social change as well as a dominance of friendship instead of kinship relationships. The homogeneity, stability, traditionalism, and slow rate of social change as well as a majority of kinship relationships are interrelated factors accounting, in part, for the in-group cleavages existing in San Juan Sur.

#### MARRIAGE AND SOCIAL CLASS

The responses of the ten judges in Atirro as to which of the social classes they would like a daughter to marry into, appears as follows:

1. A judge in social class one would prefer to see his daughter marry into class three because "these people are more cultured." His second choice would be for her to marry into class two for the same reason. He would not want to have his daughter marry into his own group "because we have less culture than the other groups." He would like very much for her to marry in group four, but states that, "this could never happen because our poverty would not enable us to arrive at a point of equality with these people."

2. A second judge in class one doesn't care into which group his daughter marries. For him, to desire is natural, and the daughter ought to marry the one she loves. But on the other hand he does feel that it would be better for her to marry into his group because, as he states, "although my daughter would suffer from hunger and the lack of accommodations, she would live much happier than if she were married to one of those in the upper groups. If my daughter could find the same happiness in one of these upper groups, it would not matter to me if she married into one of them."

3. Another judge in social class one—a combined rating—would like to see their daughter marry into class one. They wouldn't like to see her marry into class two because, "these people are very different. It is better said that they are very distant. They are very much apart and treat those in the first group (class one) with much haughtiness." They would like to see their daughter marry into class four or class three, but state that "this would be very difficult for the daughter of a poor family."

4. A judge in class two would like to see his daughter marry into his own group. In the event that this was not possible, he would like to see her marry into class three. He would prefer that she did not marry into the bottom class, nor does he want her to marry into the top grouping because, "these are the wealthy and powerful people. They are those who have, and I am a poor person who has not."

5. Another judge in class two would prefer that his daughter marry into class three, first. Secondly, he would prefer that she marry into his own group. He would not like to see her marry into the bottom class, but would be very happy to have her marry into the top grouping (class four). He states, "It would be wonderful, but it is impossible. It just isn't possible for the daughter of a campesino to marry with a capitalist. Those of the top category don't marry with those of lower categories."

6. A third judge in class two would prefer that his daughter marry into his own social class. He would not like to see her marry into the first group. His feeling about a projected marriage of his daughter with those of either class three or four is illustrated by the following statement, "it does not serve one that his daughter marry with one of those in groups three or four because it isn't correct. It isn't right that the daughter of a campesino family marry one of these because it is absurd. The lack of study and the lack of personableness between the campesinos and those in the upper groups is very great."

7. A judge in class three would like to see his daughter marry into social class two, first, and into social class three, secondly. He would not want to see her marry into either social class one or four.

8. Another judge in class three would prefer that his daughter marry into the same class as that which the family is in. His second choice would be for her to marry into class four. He does not want his daughter to marry in a class lower than the one now occupied by the family.

9. A third judge in class three would like to see her daughter marry in class four. Class three would be acceptable because "those in this latter group have possibilities of becoming as well prepared as those of class four." She would not want her daughter to marry into classes one or two.

10. A judge from class four would want his daughter to marry in the same group as that which he is in. He would not want her to marry into any of the other three classes.

An analysis of the responses of the ten judges provides a greater insight into the nature of the social class structure of Atirro. As is revealed by their responses, the large majority of them (7), indicated that they would

prefer to have a daughter marry into what they consider to be their own social class groupings. There was only one discrepancy observed between the rankings given the judges as to class status, and the rankings they gave themselves. This exception occurred with reference to one of the judges, a relative of the finca owner, who is considered generally as being of equal status with the finca owner, but whose husband is not. This judge considered herself to be of the top class, and indicated that she wanted her daughter to marry within this same group. She did not consider her family, though most of the other judges disagreed, as belonging to class three.

One of the seven judges who indicated that he would prefer to have his daughter remain in the same class stated at first that he didn't care into what class she married, but later stated that while this was true, perhaps she had better marry into her own group for though she might suffer hunger and lack of many accommodations, she would live much more happily.

Of the remaining three families, two indicated that they would prefer to have a daughter marry above their class, while one in class three indicated a desire to have his daughter marry one group below into class two. One of the two families desiring to have their daughter marry above their class was a class one peon family who desired more culture for the daughter, and the other family was upward mobile.

It is interesting to note the recognition on the part of the judges in classes one and two of the barrier existing between them and the families in classes three and four. While a number indicate in a wishful manner that they would like such an intermarriage, the large majority of the judges in these two groups feel that such a thing is next to impossible, and/or improper. This feeling is best described by the comment of one judge who said, "it would be wonderful, but it is impossible."

That marriage in Atirro tends to be structured in a manner closely analogous to visiting is indicated by the fact that marriage above or below one's class is usually limited to the classes immediately adjacent, and to be generally in one or two classes. Even where judges indicated that they preferred the marriage of their daughters to be within their own class, a number looked upon marriage into the next higher status grouping with a degree of tolerance if not favor.

The feeling of the judges against their daughters marrying beneath their own class is expressed by six out of the seven, who are found in classes other than that at the bottom.

The responses of the ten judges in San Juan Sur as to which of the social class groupings they would like to see their daughters marry into appears as follows:

1. A judge in class one would prefer that his daughter marry into his own class, "los bajitos," because she would be happier in this group. He would permit her to marry into class two, but he would not be happy about it. The same applies to class three—he would not approve of it.

2. Another judge in class one would like her daughter to marry into the second class "el grupo mediano." Her second choice would be that her daughter marry into class three, "el grupo de los primeros." She would prefer that her daughter not marry in class one.

3. A third judge from class one would like to have her daughter marry into class one because that is the group in which she would be most happy. If the daughter were in agreement, and if she would be happy, it would be all right for her to marry into class two or three.

4. A judge in class two would like to have her daughter marry into class three. Under no condition would she want her daughter to marry into class one, "because these persons have tarnished reputations—they are not people of confidence." It would be all right if her daughter married into class two, but she would prefer the third class.

5. Another judge from class two would like to have their daughter (this is a combined rating from both parents) marry into their own class because she would be more contented and happy. It would be all right if she married into class three, but they would not like her to marry into the bottom group.

6. A third judge from class two would like his daughter to marry into the same class. If, however, the daughter wanted to marry into class three it would be all right, but he feels that perhaps it would not work out as well, and that it would be better for her to marry in her own group. He prefers that his daughter not marry into class one.

7. A judge in class three would prefer that his daughter marry into class three. He definitely does not want her to marry into class one, but feels that if she wants to marry into the middle group (class two) it would be all right.

8. Another judge from class three would prefer that his daughter marry into class three because he believes she would get along better in this grouping. He would permit her to marry into class two, but by no means would he want to see her marry into class one.

9. A third judge from class three, a combined rating, would prefer that their daughter marry into class two because they believe that the characteristics of this class are such that their daughter would be happiest married into this group. They state, "one looks for her line (class) that comes



through her inheritance, and if she attempts to marry into a higher category, she would find that the life, customs, and preparation would be different and not conducive to her having a happy life." Their daughter could marry into class three, but for her background, it would be best to marry into class two. They do not want her to marry into class one. Such a thing would be very disturbing to them.

10. The last judge from class three would not like to have his daughter marry into any of the classes that exist in San Juan Sur. He would like to provide her with a little more education and have her marry a good, honest, hard-working, middle class man of the outside. In the event that she married within the community of San Juan Sur, he would like to have her marry into class three. He would not want her to marry into either of the two lower groups.

An analysis of the responses of the judges in San Juan Sur reveal that the major proportion (6) indicated they would like to see their daughter marry within what they considered to be their own class. The rankings which the majority of the other judges gave each individual judge, and the ranking that judge gave him or herself corresponded in all but one instance. This exception indicated that she felt her family unit to be a part of class three, while the majority of the other judges placed this family into class two. This judge indicated that she would want her daughter to marry from among the eligible males of class three, and inasmuch as she had already ranked herself as a member of this grouping, her response is included raising the number to seven who indicated their desire to have their daughters marry within their own class.

There were two judges who indicated they would like to have their daughters marry above their class while one judge evidenced a desire to have his daughter marry into a lower grouping. One of those desiring for their daughter to marry above her present class was a family in class one, while the other was of English descent who didn't feel that any of those living in the community were quite good enough for his daughter, and would prefer that she marry some good middle-class man from the outside.

The family which preferred that their daughter marry into a lower class was ranked by the majority of all the other judges and ranked themselves as being of class three. This family philosophically indicated that their daughter should marry into class two for her own happiness because of a background which was more suited to those in class two than to those in class three.

Marriage relations in San Juan Sur tend to be similar to visiting



relations as is indicated in the fact that both types of phenomena are largely in one or two classes. While the majority of the ten judges indicate that they would prefer their daughters to marry into their own class, a significant number of these indicated that if their daughters should want to marry into the upper class adjacent to their own, it would be all right. The three families who preferred that their daughter marry into a different class indicated adjacent classes to be their choices.

The feeling of the various judges against their daughters marrying beneath their own class is indicated by a consideration of the responses of the seven judges who are above the bottom class in their status positions. The three judges in class two definitely do not want their daughters to marry into class one. Three of the four judges in class three feel the same as those of class two, though somewhat less strongly. The fourth judge (a combined rating) though opposed to their daughter's marriage into class one, actually preferred that she marry into class two. A comparative analysis of the judges responses for the two communities reveals that in both, the large majority (70%) would prefer to have their daughters marry into their own social class grouping. Generally, when they desired that she marry into another class, it was to one adjacent to their own.

The evidence would appear to indicate the similarity between visiting relations and marriage relations in each settlement, with both being class-typed (tending to be in one or two classes). The marriage preferences of the judges and their accompanying comments serve to provide additional evidence of the existence, and strength of barriers to intimate association existing between the classes. In both communities a number of the judges indicated an inner desire to have their daughters marry up into the top class, but recognized the difficulty, or even impossibility of such a union.

The great social distance between certain of the classes was particularly evidenced in Atirro. It is partially explainable through the wider divergence between the top and bottom classes when compared with San Juan Sur.

Another factor involved in the greater emphasis of the judges in Atirro upon the status distinctions occurring is the comparative lack of upward mobility, particularly among those of the bottom group, in relation to San Juan Sur.

As indicated by the judges' comments, in both communities, though the majority favor the marriage of their daughters into their own class for the daughters' happiness, they would generally not oppose a marriage into an upper class if the occasion arose. A number of the families indicated their reactions by stating that their first choice would be for a daughter to marry

into their own group and their second choice would be for her to marry into the social class above and adjacent to theirs in the hierarchical structure. The large majority of judges in both communities were definitely not in favor of their daughters' marrying beneath their social class.

There appears, however, an interesting difference between the communities in this respect. In Atirro the judges generally oppose the idea of their daughters marrying beneath their own social class, while in San Juan Sur although the judges in the second and third classes generally oppose marriage with those of the bottom group, two of the four judges in the top class (class three) indicated that while they would prefer that their daughters marry into the top group, it would be all right if they married into class two. In fact a judge and his wife in class three indicated that they would actually prefer to see their daughter marry into class two and that class three would be their second choice.

In general, however, the findings in San Juan Sur and Atirro, as indicated by the judges' responses, agree with those of Warner and Lunt, that in a class system, "a positive sanction is placed on bettering oneself, making a 'fine marriage,' and a negative sanction on the opposite of 'lowering oneself' or 'marrying beneath oneself.'"<sup>17</sup>

The responses of the various judges, insofar as they may be representative, reveal the desire of the people generally to be upward mobile, and to improve their status positions, but at the same time recognizing the existence of class barriers to this upward movement. By virtue of the fact that they express a recognition of these barriers, they inadvertently indicate cleavages that exist as a result of them.

<sup>17</sup> Warner and Lunt, *op. cit.* p. 92.

# DEMOCRATIC METHODOLOGY IN PHYSICAL EDUCATION<sup>1</sup>

## *A Sociometric Study*

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### *Purpose*

The aim of this study was to explore and test some teaching methods in physical education that gave promise of contributing to the educational objective of furthering democratic principles by translating democratic tenets into democratic action on the playfield and in the gymnasium, and testing some of the outcomes in three high school girls' physical education classes sociometrically.

### *Justification*

Physical education has many innate advantages over other school subjects for implementing democratic experiences. Play is a powerful motivator, and the inherent game elements of cooperation in a framework of competition provide a meaningful context for living rather than just talking democracy. But just exposing youth to athletics is insufficient to guarantee the desired democratic outcomes. The totalitarian dictators capitalized on these potentialities to implement their ideologies successfully. How, then, can democracy utilize physical education's inherent values to further its ideology?

### *Methods of Research*

In trying to answer this question, the investigation was divided into two parts: Part one explored the historical evidence that indicated that physical education has been used throughout ancient and modern times to foster ideologies, and set forth justification for democratic methodology. The tenets and elements of democracy as stated by the consensus of the President's Commission Higher Education were presented concomitantly with specific action methods for their implementation that were applicable to high school physical education classes.

Part two described some of the outcome of this methodology as demonstrated empirically and sociometrically in three upper division classes in girls' physical education in a large city high school during one eighteen week semester. The paternalistic-authoritarian administration of this school gave cooperative sanction to the trial of democratic practices in these classes

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<sup>1</sup> Summary of doctoral dissertation at Stanford University.

within rather rigid limits imposed by its autocratic policy. Inadequate play space and very large classes imposed further limitations. In this setting 141 girls participated in a program which aimed to provide meaningful situations for the practice of democratic living. These situations were created by explicit environmental manipulation devised to foster a democratic class climate. The need for and some of the results of this manipulation were pointed up by the findings of a planned series of sociometric tests, and empirical observation.

### *Summary of Democratic Teaching Methods Used in this Study*

Explicit effort was made to translate democratic principles into action situations so as to increase interaction through participation, to effect upward mobility, increase group cohesion, decrease the number of rejects, isolates and near-isolates, improve physical and communicative skills, and to induce pupil cognizance of the process, values and limitations of democracy. The multifarious devices used to achieve these aims were selected in accordance with the dynamics of each class situation. No constellation of set methods can be prescribed to cope with all exigencies, but throughout the term the following procedures were used in all classes:

- (1) The democratic process was discussed, and by joint teacher-pupil planning and group process techniques the classes were conducted as laboratories of democracy. By reciprocal assumption of the expert and member roles the instructor and the pupils shared responsibilities in accordance with their maturity and abilities.

- (2) To induce interaction squads were selected anew for each activity unit on the basis of stated preferences on functional choice tests. Student elected officers were chosen every three weeks, and opportunities were provided to further acquaintanceship through mixers, tournaments, etc.

- (3) Individual and group guidance techniques were used to foster upward mobility and increase group cohesion.

- (4) Opportunities were provided to encourage self direction, responsibility for one's own actions, self and peer evaluation on the basis of merit only, recognition and empathy for individual differences, and competition in a framework of cooperation.

- (5) Buzz sessions, sociodrama, and problem solving devices were used.

### *Moreno Techniques Used in this Study*

The following Moreno tests were given:

- (1) *Acquaintance volume tests*: The purpose of these tests was to measure the increase in acquaintanceship in the classes during the

term and thus partially determine the extent of interaction. On the first and last days of class each girl listed the classmates whom she knew by first and last names.

(2) *Functional choice tests*: Three times during the term, the first and last days of class and halfway through the semester, the pupils submitted a confidential list of not more than five girls whom they would prefer as squadmates for the ensuing activity unit. The students were also permitted to designate any classmates whom they did not wish to have on their squad. The purposes of these tests were:

- a— To serve as the basis for squad assignments.
- b— To locate the chosen and rejected students.
- c— To determine changes in individual status and group cohesion.
- d— To verify empirical observation of the nature of the needs of individuals and groups for guidance aimed at the improvement of interpersonal relations.

To supplement and assist in the interpretation of these objective data, relevant background information on each pupil was obtained from school records, counselors and other teachers. Anecdotal records of significant behavior were kept, and conferences were held with faculty, parents, students, school nurse, school doctor, and juvenile court authorities.

#### *Treatment of the Sociometric Data*

*Acquaintance volume test* results were determined by simple arithmetical differences and percentages, and the termwise increase was thus ascertained for each pupil, each class, and the combined three classes.

*Functional choice test* data were treated as follows:

(1) The following Individual Status Index (ISI) formula was used to judge changes in status, or mobility.

$$ISI = \frac{TC-TR}{N-1} \text{ or } \frac{\text{Total choices minus total rejections}}{\text{Number in class minus 1}}$$

(2) The following Group Cohesion Score formula (GCS) was used to judge changes in group cohesion or we-feeling of each class, and the total of the classes. The formula follows:

$$GCS = \frac{TC-TR}{N(N-1)} \text{ or } \frac{\text{Total choices minus total rejections (for group)}}{\text{Number in group times Number minus 1}}$$

(3) Isolates, near-isolates and rejects were judged by simple arithmetical differences and percentages, and the termwise changes were thus determined for each pupil, each class, and the combined classes.

*Some Outcomes of Democratic Methodology as Measured Sociometrically in this Study*

(1) *Acquaintance volume* per pupil almost doubled during the term. Expressed in percentages of new acquaintances made in eighteen weeks, the gains in each of the classes (means) were, 50.4, 44.81, and 40.4, respectively.

(2) *Upward mobility* was experienced by 75% in the combined classes.

(3) *Downward mobility* was evidenced in 13% in the combined classes.

(4) *No change in individual status* was evidenced by 12% in the combined classes.

(5) *Group cohesion* showed a slight but measurable gain during the term. In one class there was a mid-semester decrease in the GCS which was later counteracted; this class' final GCS showed an overall increase in cohesion. The other two classes demonstrated a small, but steady, gain in cohesion throughout the term.

(6) *Rejects* in the total classes decreased approximately 50% in the number of girls rejected and 60% in the total number of rejections when the start and end of the term scores were compared.

(7) *Isolates* totalled eight at the start of the term and decreased to three by the end of the term.

(8) *Near isolates* decreased from an original twenty-seven to eleven during the term.

*Student Opinion Questionnaire*

To determine the pupils' reactions to the democratic teaching methods used in this experiment, a "Student Opinion Questionnaire" was circulated the last day of the term. Anonymous replies to 144 multiple choice and open-end questions showed that the large majority of the girls approved of the methods, enjoyed the class, were conscious that they had been practicing democracy, and favored the devices used to increase leadership, interaction and self direction.

*Conclusions*

(1) Some aspects of democratically desirable human relationships as evidenced in physical education classes can be measured objectively by use of sociometric techniques.

(2) When democratic methodology was employed in three girls' physical education classes during an eighteen week term in a large, city high school with an authoritarian administration:

(a) Empirically, the methods were found to be practical.

(b) The sociometric data reflect the empirical observations that the following outcomes occurred:



1. Marked interaction was evidenced by greatly increased acquaintanceship.
  2. Upward mobility was experienced by the large majority of pupils.
  3. Significant decreases occurred in the number of rejects, isolates, and near isolates.
  4. Group cohesion increased slightly.
  5. The pupils themselves enjoyed their class and approved of the teaching methods used; they were conscious that they had been experiencing democratic processes in their daily class.
- (c) Therefore, since these outcomes are among those deemed socially desirable in a democracy, the methodology used in these classes appeared to have contributed to the furtherance of the democratic ideal amongst its members.
- (3) If, then, the democratic potentialities inherent in the sport context were implemented in each school physical education class by democratic methods, and, if the outcomes of improved human relationships reflected those which occurred in this study, American youth should find the kindergarten through junior college physical education requirement a long term, effective, enjoyable, and meaningful experience in democratic living.

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- (1) Lloyd Allen Cook, "Manual for Obtained, Analyzing and Diagramming Sociometric Data", College Study in Intergroup Relations, Detroit, Michigan. (Mimeographed)
- (2) Ibid.
- (3) J. L. Moreno, "Who Shall Survive?, A New Approach to the Problem of Inter-human Relations", 1st edition 1934; revised edition 1952, Beacon House Inc.

## SUMMARY OF CHANGES IN ACQUAINTANCE VOLUME AND INDIVIDUAL STATUS INDICES

Class X N-46	Acquaintance Volume						Individual status indices			
	Test I		Test II		Term increase		Test I	Test II	Test III	Termwise change
	Students	%	Students	%	Students	%				
Mean	14	29.8	37	80.2	15.8	50.4	+.067	+.064	+.106	+.0390
Range	0-34	0-73	21-46	45-100	3-36	4-79	-.10 to +.20	-.06 to +.20	+.02 to +.25	-.05 to +.15

## Summary of Changes in Individual Status Indices

No change	6 students
Individual status index increased	30 students
Individual status index decreased	10 students

Class Y N-52	Acquaintance Volume						Individual status indices			
	Test I		Test II		Term increase		Test I	Test II	Test III	Termwise change
	Students	%	Students	%	Students	%				
Mean	16.3	30.7	39.5	75.7	23.9	44.8	+ .059	+ .071	+ .10	+ .0404
Range	0-29	0-55	21-52	40-100	10-34	19-65	— .11 to + .18	+ .01 to + .18	+ .01 to + .27	— .06 to + .20

## Summary of Changes in Individual Status Indices

No change	5 students
Individual status index increased	43 students
Individual status index decreased	4 students

Class Z N-43	Acquaintance Volume						Individual status indices			
	Test I		Test II		Term increase		Test I	Test II	Test III	Termwise change
	Students	%	Students	%	Students	%				
Mean	24.9	56.8	41.9	97.2	17.7	40.4	— .073	+ .083	+ .114	+ .041
Range	8-42	18-97	35-43	55-100	1-34	3-79	— .07 to + .26	— .04 to + .26	0 to + .26	— .07 to + .16

## Summary of Changes in Individual Status Indices

No change	6 students
Individual status index increased	32 students
Individual status index decreased	5 persons

## Total of Three Classes

No change	17 students
Individual status index increased	105 students
Individual status index decreased	19 students
Total	141 students

## GROUP COHESION SCORES OF THREE CLASSES

Class	N	Test I	Test II	Test III	Gain during term
X	46	.10	.08	.11	.01
Y	52	.09	.10	.13	.04
Z	43	.08	.09	.10	.02
Mean		.09	.09	.1146	.0233

## NEAR-ISOLATES IN THREE CLASSES

Class	N	Test I	Test II	Test III	Decrease during term
X	46	10	6	6	4
Y	52	6	4	4	2
Z	43	11	6	6	5
Total	141	27	16	16	11

## ISOLATES IN THREE CLASSES

Class	N	Test I	Test II	Test III	Decrease during term
X	46	5	0	1	4
Y	52	1	0	1	0
Z	43	2	0	1	1
Total	141	8	0	3	5

## REJECTS IN THREE CLASSES

Class	N	Test I		Test II		Test III		Decrease during term	
		Girls rejected	Total rejections	Girls rejected	Total rejections	Girls rejected	Total rejections	Girls rejected	Total rejections
X	46	9	12	17	51	8	10	1	2
Y	52	8	12	2	2	2	2	6	10
Z	43	14	27	11	22	5	5	9	22
Total		31	51	30	75	15	17	16	34
Mean		10.3	17.	10	25	5	5	5.66	11.33

# INJURY-PRONENESS AND ADJUSTMENT IN A SECOND GRADE\*

## A Sociometric Study

ELIZABETH MECHEM FULLER AND HELEN B. BAUNE

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### INTRODUCTION

Are some children injury-prone? Research in this provocative field, limited in scope and inconclusive in evidence, has been confined to descriptions of children as individuals. *Injury-proneness as a group phenomenon* has yet to be investigated: *Do children with a high incidence of injuries reveal definable positions in their school social structure?* Can injury-proneness be recognized by school personnel?

Injury-proneness as a cluster of human traits was investigated in a preliminary study conducted at the University of Minnesota Institute of Child Welfare (1). The findings suggested the possibility that some systematic trait relationships can be described which seem to produce something akin to injury or accident proneness in children of nursery school age.

In a further effort to determine some of the factors which influence the incidence of injuries, the present study considers social acceptance, personal adjustment, and academic achievement at the lower elementary level and relates them to first aid referral records.

The children enrolled in the second grade of the University Elementary School, University of Minnesota were selected for study. Their selection was the result of routine analytical procedures at the campus school which must be clearly understood before the data can be interpreted. When injury scores (research in progress since 1945 (1) were analyzed for the year under study, the second grade injury frequency was five times greater than that of any other group in the school. Because of the high percentage of injuries accumulated during their second grade experience, the staff decided that the first aid referral records should be analyzed during the Fall Quarter of their third grade experience to determine the permanence of the injury trend. Furthermore, by November, the group in question was requiring extra attention for other problem-producing tendencies: their third grade teacher had reported that the social structure of the class was monopolistic,

\* This article is released primarily because of the suggestiveness of the hypothesis.  
*Editor's Note.*

incompatible and, that the attitude and behavior of many of the children reflected unhappiness in their school environment. When the first aid referral records revealed a concurrent increase in injury frequency, it was decided that the social pattern and personal adjustment of the group should be analyzed, and the findings related to pertinent data from their second grade cumulative records. Therefore, the time lag in the source material for this study covers a period of six months: academic achievement, intelligence, chronological age, and first aid referrals were evaluated from the terminal records of the second grade experience; social structure, behavior patterns, and affectivity were evaluated in November of the third grade experience. For clarity, the children in the study were considered members of the second grade.

Necessarily, only those children enrolled during both years could be included in the study; since enrollment was limited to twenty-five children per class, withdrawals reduced the experimental group to twenty-two children. Statistical procedures were handicapped by the small number available for the study; in most cases, ratings have been converted into ranks, and central tendencies expressed in median ranks to minimize the difference in the nature of the ratings and to reduce the influence of extreme scores in the small group. Other procedures (percentile ranks, etc.) have been employed only to take advantage of available normative data based on larger populations.

#### DESCRIPTION OF THE CHILDREN

The second grade children who served as subjects for the study came from homes of relatively high socio-economic status. The University Elementary School is a private school with registrants from most of the more desirable residential districts of the twin city area. With the school population pin-pointed throughout a twenty-mile radius, community tone or neighborhood friendships have little significance in the social structure of the student body. However, the individual background of the children must be considered an integral part of any evaluation of their social pattern.

The eleven boys and eleven girls in the study were accelerated in general development. Their chronological ages ranged from seven years and five months to eight years and three months with a mean C.A. of 7-9. Their intelligence quotients ranged from 108 to 174 with a mean I.Q. of 133. Reading ages ranged from 8-1 to 13-1 with a mean R.A. of 9-10. Reading quotients (R.A./C.A.) ranged from 106 to 176 with a mean R.Q. of 127.4.

## INCIDENCE OF INJURY IN THE SECOND GRADE

A study of injuries received by the children has been in progress at the University of Minnesota campus school since 1945. The annual summary of first aid referrals revealed that during their second grade experience the group under observation received FIVE TIMES as many injuries as any other group in the school. The November analysis of first aid referrals not only revealed the same high incidence of injuries, but indicated no decrease in injury frequency for their third grade experience. Previous analysis of first aid records in this school had shown a slight but steady decline in the total numbers of injuries, as well as in the various classifications of injuries, throughout the elementary grades.

*Analysis of First Aid Referrals.* Because of the current research interest in injury-proneness, careful attention is given to recording injuries, even those of a minor nature, and referral to first aid may be considered a relatively accurate measure of injuries received. All first aid records are kept by the school nurse. The first aid chart includes the date of injury, name and grade of the patient, nature of injury, how it occurred, who was involved, description of treatment, witnesses to injury and treatment, and the signature of the person who administered treatment. To conform with the school pediatrician's classifications for pediatric practice, injuries are classified under six general headings: contusions, lacerations, abrasions, bites, foreign bodies, and miscellaneous (referrals following bumps and falls where no injury was found, fractures, sunburns, nosebleeds, etc.).

*Incidence of Injuries.* First aid scores include referral for all of the above classifications with no attempt to determine either the "accidental" nature or the relative seriousness of the injury. The relative number of injuries in each of the six classifications are shown below expressed in percentages of total injuries:

	Contusions	Lacerations	Abrasions	Bites	Foreign Bodies	Misc.	Total
% of total							
Boys	.67	.11	.15	.00	.05	.02	100%
Girls	.47	.08	.25	.01	.17	.02	100%

Injury scores for boys ranged from 1 to 24, with a mean injury rate of 11.2; injury scores for girls ranged from 1 to 16, with a mean injury rate of 7. Approximately one-fourth of the girls were referred to first aid ten or more times; two-thirds of the boys were referred ten or more times.

For purposes of analysis, the injury scores were adjusted for absenteeism



by equating the referrals and daily attendance of each child; the actual number of injuries was divided by the days attended and then multiplied by 1000 to convert all scores to whole numbers. The equated scores revealed that 50 per cent of the boys' injuries involved only 36 per cent of the boys enrolled; 50 per cent of the girls' injuries involved only 27 per cent of the girls enrolled. Therefore, referrals were not distributed evenly among the children, and would suggest a "repeater" tendency in both sexes.

#### INJURIES AND SOCIAL STRUCTURE

The relation of the atypically high incidence of injury-getting to the social structure of the group was then studied through sociometric analysis.

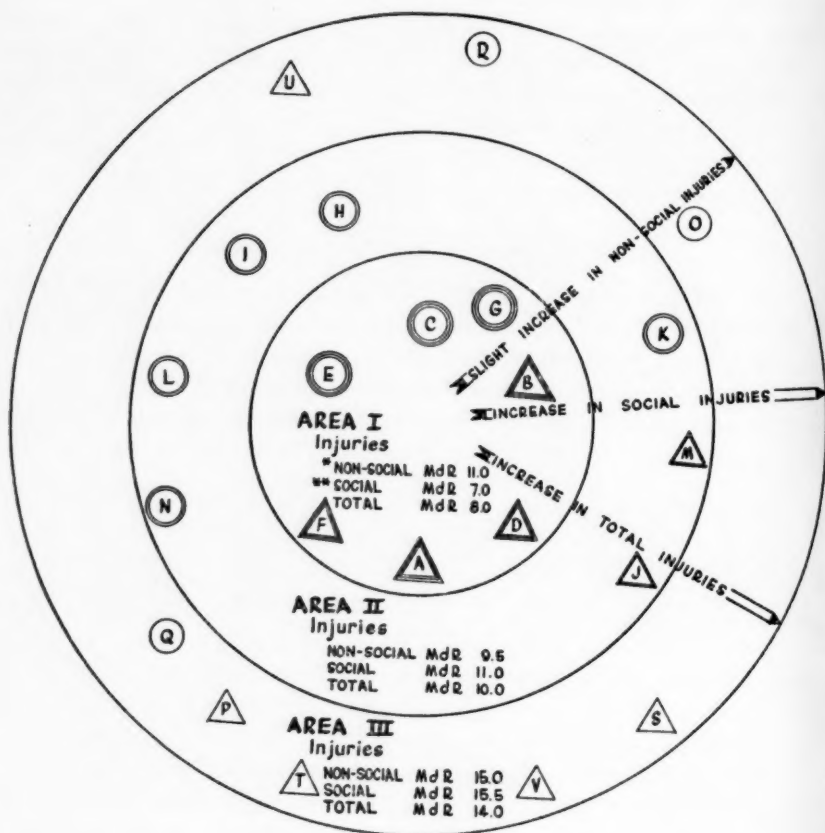
In November of their third grade experience the twenty-two children under observation were interviewed by one of the authors. The Moreno (5) technique was used for the interrogations. Each child was asked the following four questions:

1. Which two children would you like to have lunch with today?
2. Which two children would you like to work with in class today?
3. Which two children would you like to play with at recess today?
4. Which two children would you like to go to the movies with next Saturday?

Social status scores were determined by deriving a total score based on the total number of times each child was chosen as first or second choice by the other children.

For purposes of analysis, the social status scores were plotted on a sociogram, Figure I.\* All supporting data were presented in code form: each child was given a code letter to conform with his social status rank; A represented the highest and V the lowest social status score; boys were coded in triangles and girls in circles to indicate sex distribution. The children were ranked in upper, middle, and lower thirds rather than the more usual quartiles because of the small number in the study. The inner circle, Area I, represents the socially popular group, the children whose social status scores were in the upper third; the center circle, Area II, represents the children of average popularity; the outer circle, Area III, represents the children of low popularity. Single outlines are used for the circles and triangles in Area III to suggest few choices; double outlines are used in Area

\* Acknowledgment is made to Kaoru Endo and Sam Nakanishi for reproductions of Figures I, II, III, and IV.



**Figure I**  
Sociogram For Grade II  
Showing area of Distribution  
of Injuries

- INJURIES INVOLVING NO OTHER CHILDREN
- INJURIES INVOLVING OTHER CHILDREN

○-GIRLS    △-BOYS

II to suggest more choices; and triple outlines are used in Area I to suggest many choices.

Social, non-social, and total injury scores were plotted on the sociogram in Figure I. Scores were expressed in terms of median ranks for the three areas because of the small number of children in the study and to reduce the influence of a few extreme scores. Captioned arrows indicate the frequency trends.

*For this particular group* social status does seem influential in the injury situation. Differences are greatest in the social injury classification, but the same trend is maintained in the non-social classification—the most popular children get hurt the least, the least popular children get hurt the most. However, it must be remembered that Figure I describes the social pattern and injury relativity of only one classroom. Earlier studies have suggested that *the injury-prone child is by no means an extremely maladjusted, retarded, or generally undesirable youngster*. The present study suggests that he tends to have more problems than the non-injury-prone child, but the problems seem to be associated with otherwise quite desirable traits.

*Social and Non-Social Injuries.* The first aid referral charts described the social nature of injuries: social, those involving other children, and received at play, at work, or in conflict; non-social, those received in a solitary manner, from contact with materials or equipment. As recorded, 50 per cent of the boys' injuries were social, and 50 per cent were non-social; 19 per cent of the girls' injuries were social, and 81 per cent were non-social. The girls' comparatively low percentage of social injuries was of interest, because in a preliminary study conducted at the University of Minnesota Nursery School (1) the girls' social injury percentage was also 19 per cent of the total injury score.

The relative number of social and non-social injuries for each child is shown in Figure II. The injury profile shows the individuality of injury-getting in the group: The most popular children, A through G, not only receive fewer injuries, but their injuries are predominantly non-social in nature. Child F, with the highest injury score in the class, seems misplaced in this group. The children of average popularity, H through N, receive more injuries, but the ratio is slightly more balanced between social and non-social types. The socially rejected children, O through V, have the highest number of injuries, a larger proportion of which are social in infliction. Child R, with one non-social injury, seems misplaced in this group.

The large proportion of social injuries accumulated by the social isolates is a reversal of the social injury trend revealed in the earlier study of nursery school children:



**Figure II**  
Relative Proportions of Grade II Injuries  
Which Did (Social) and Did not (Non-social)  
Involve Other Children

"Inspection of the records shows that children who play together are more apt to hurt each other than do those who play alone. In fact, the injury records might suggest social discord where it is least apt to exist unless this factor of proximity-by-virtue-of-friendship is recognized." (1)

It may be argued that three and four year olds have not yet developed effective social techniques, and the socially preferred children receive more injuries because of their range of activities within the group. Seven and eight year olds may have developed more skill in making social contacts and avoiding trouble socially, and consequently more volition in hurting each other in conflicts. Therefore, the smaller children hurt their friends and "enemies" indiscriminately; and the older children hurt their "enemies". However, the earlier study did not use sociometric methods, but based friendship factors on the judgments of the teachers, and the two studies differ in that respect.

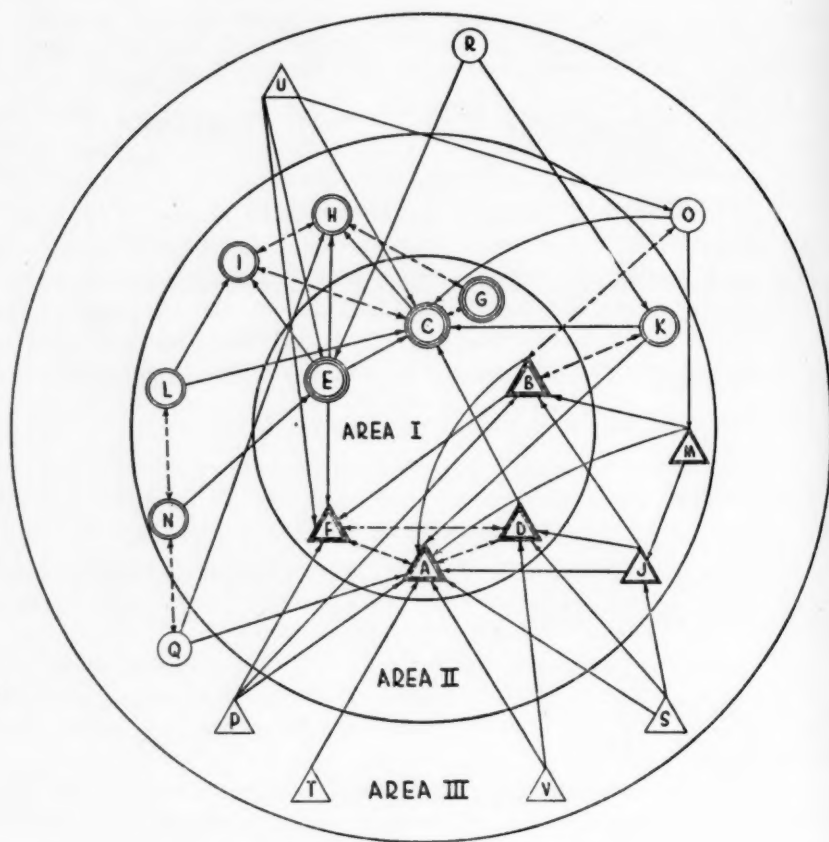
#### SOCIAL STRUCTURE AND PERSONAL ADJUSTMENT

The suggested relationship (Figure I) between injury-getting and social status within the second grade group increased the interest in exploring further the classroom teachers' claim that the social structure of the group left much to be desired. In addition, it became important to know whether the personal adjustment of the children would show any tendency toward falling into a similar pattern on the sociogram as had injury scores.

Figure III utilizes the sociogram drawn for Figure I, but shows also individual pupil choices of their classmates. Single-headed arrows and solid lines indicate friendship choices; double-headed arrows and broken lines indicate mutual choices.

By showing the actual distribution of the social status scores, it becomes evident that a few children occupy extremely preferred social positions: the most outstanding child in social preference is Child A with a monopolistic score of twenty-five; eight other children share his social prestige with scores ranging from ten to eighteen. At the outer fringe of the social pattern is Child V who received no friendship choices, and Children R, S, T, and U who received only one score each for second choice. It is also evident that the children who occupy Area I on the sociogram enjoy warmer, more mutually reciprocated choices for the various activities than the children in Area III. Thus, the expressed belief that the social structure of the group was monopolistic, undesirable, and problem-producing is supported by the sociometric analysis.

For purposes of comparing social data with other measures, the methodology of concentric circles, using Areas I, II, and III, was maintained throughout the study, and the identity and status of the children remained the same on all sociograms.



### Figure III

Sociogram for Grade  
II

Arrows Indicate Direction of  
... Sociometric Choices...  
(-----) Indicate mutual choices



In measuring personal adjustment it was considered logical to obtain one measure of the child's own viewpoint of his happiness and adjustment and one or more measures of the teacher's viewpoint of the child's adjustment. Ratings of self-adjustment were obtained by using the Fuller Affectivity Interview Blank (2) in individual interviews with the children. Teachers' ratings of pupil adjustment were derived from the Haggerty-Olson-Wickman Behavior Inventory (3), and the revised Read-Conrad Behavior Inventory (6).

Figure IV presents a comparative analysis of the personal adjustment of the children in Areas I, II, and III. Measures of pupil adjustment are plotted on the original sociogram of Figures I and III, but the choice lines have again been omitted for ease in reading.

*Children's Ratings of Self-Adjustment.* Ratings of self adjustment were obtained by using the Fuller Affectivity Interview Blank (2) in individual interviews scheduled shortly after the interviews which provided the social status information.

Affectivity scores for the twenty-two children range from 38 (percentile rank of 1) to 68 (percentile rank of 93) and indicate the range of general affectivity or happiness in the group. On the basis of the limited normative data available, the mean score on the Fuller Affectivity Interview Blank (2) for children thus far interviewed is between 55 and 60. The mean score for the children included in the present report is 54.4, a figure roughly comparable to the general norm.

The affectivity scores were grouped according to the children's relative positions on the sociogram in Figure I. Affectivity (or general state of happiness) medians for Areas I, II, and III are shown in Figure IV. Scores are expressed in terms of median percentile ranks to take advantage of normative data on large populations. While the raw scores on affectivity interviews do not vary markedly on the three sociogram areas, median percentile ranks show a tendency for the less happy children to be more rejected socially than the happy children.

On the happiness scale the most popular children (Area I) earned a median percentile rank of 50; the middle group (Area II) have a median percentile rank of 40; and, the least popular group (Area III) have a median percentile rank of 35. However, it cannot be assumed without further study that a causal relation exists in either direction (isolated because unhappy or unhappy because isolated). Nevertheless, it is suggested in Figure IV that for the small group represented the degree of social preference and the degree of happiness as described by the individual children are related to each other in a positive way.

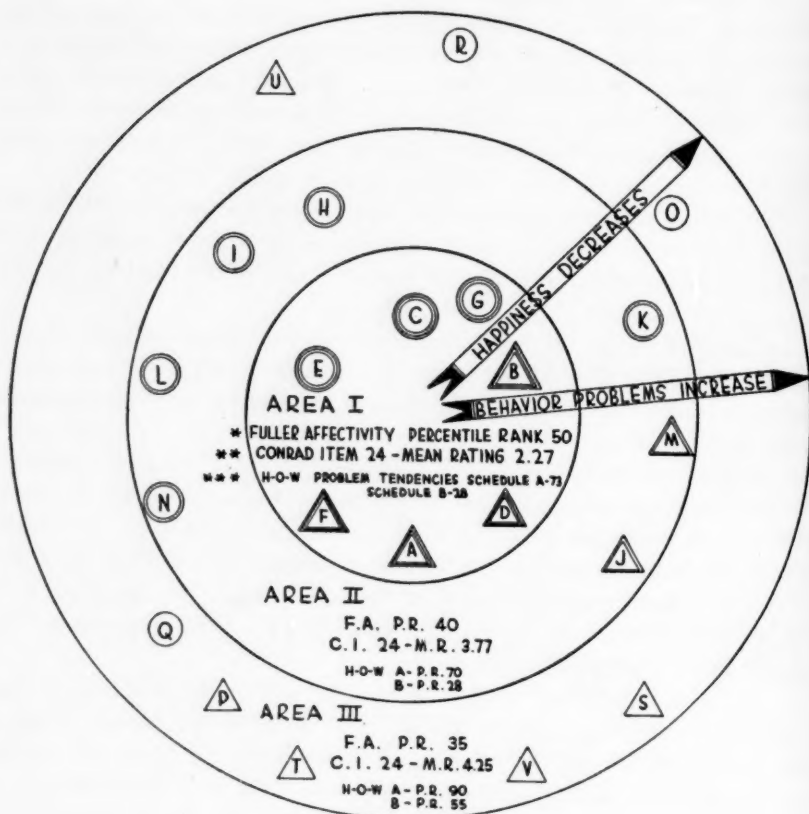


Figure IV

## Sociogram For Grade II

Indicating Happiness Scores and Behavior Problem Tendencies  
 for Children in the Three Sociometric Areas  
 Derived from Figure I

- \* FULLER AFFECTIVITY INTERVIEW BLANK - HIGH SCORES INDICATE HIGH LEVEL HAPPINESS  
 \*\* CONRAD BEHAVIOR RATING INVENTORY ITEM 24 - LOW SCORES INDICATE HIGH LEVEL HAPPINESS  
 \*\*\* HAGGERTY-OLSON-WICKMAN BEHAVIOR RATING SCHEDULES A & B - HIGH SCORES  
 INDICATE MORE BEHAVIOR PROBLEMS

*Teacher's Rating of Pupil-Adjustment.* Ratings of pupil adjustment were obtained from the Haggerty-Olson-Wickman Behavior Rating Schedules (3). Each child was rated by the head teacher. Scores on Schedule A (behavior trait check list) ranged from 0 to 71, a range in percentile ranks from 16 to 98. Scores on Schedule B (a rating scale composed of mental, physical, social, and emotional behavior samples) ranged from 40 to 86, a range in percentile ranks from 2 to 84.

The teacher's ratings of the children's behavior appear on Figure IV (H-O-W Tendencies) and show the relative status of the popular children and the social isolates. In Area I the popular children earned median percentiles ranks of 73 on Schedule A, and 28 on Schedule B. In Area II the median percentile ranks were 70 on Schedule A and 28 on Schedule B. In Area III the more rejected children scored median percentile ranks of 90 on Schedule A and 55 on Schedule B. Since high scores on the H-O-W Behavior Schedules are undesirable, the teacher's ratings reveal that the more popular children have fewer problem tendencies than the social isolates.

While the present study was in progress, other research efforts were being directed toward developing a new scale for measuring classroom behavior through the years from nursery school to high school. As a part of this concurrent study, the second grade children had been rated by several student teachers and their head teacher on selected items from the Conrad Behavior Rating Inventory (6).

The mean ratings for Item 24, as shown in Figure IV, indicated that happiness decreased as children approached the outer circle of social acceptance: Area I ( $M = 2.27$ ); Area II ( $M = 3.77$ ); Area III ( $M = 4.3$ ). The teachers' judgments of happiness were considered particularly significant because they substantiated the children's self-judgments of happiness obtained in the Fuller Affectivity Interviews.

Conrad Items 31, 57, 59, and 60 were selected for their possible relation to the injury patterns. They were also analyzed for sociometric significance.

The mean ratings for Item 31, Reaction to Social Pressure, indicated that the children in Areas I and II exercised judgment in resisting social pressure, but the children in Area III displayed individualistic tendencies. Area I ( $M = 3.6$ ); Area II ( $M = 4$ ); Area III ( $M = 5.4$ ).

The mean ratings for Item 57, Quarrelsomeness, revealed that the children in Areas I and II were usually peaceful and quarreled only when wronged; the social isolates in Area III, however, displayed aggression and touchiness in their social contacts. Area I ( $M = 4.2$ ); Area II ( $M = 4$ ); Area III ( $M = 2.2$ ).

The mean ratings for Item 59, Attacking Others, revealed that the children in Areas I and II were above average in non-aggression while the children in Area III were easily aroused to attack. Area I ( $M = 4.6$ ); Area II ( $M = 4.6$ ); Area III ( $M = 2.4$ ).

The mean ratings for Item 60, Delayed Retaliation, revealed that the children in Areas I and II were not revengeful; the children in Area III were revengeful, but the trend was not strong. Area I ( $M = 4.3$ ); Area II ( $M = 4$ ); Area III ( $M = 2.6$ ).

The teachers' appraisals of the selected Conrad Items would suggest that the problem tendencies exhibited by the socially rejected children in Area III contribute to their isolation and relate to their self-judgments as to happiness in the social structure of the group.

There seems to be a demonstrable relationship between social status and personal adjustment in the second grade; the children's ratings of self-adjustment and the teachers' ratings of pupil adjustment indicate that unhappiness and behavior problems increase as the children approach the outer fringe positions in the social pattern. It has already been shown that there seems to be injury-getting significance in the position the child occupies on the sociogram. Therefore, it seems logical that personal adjustment, social status and injury-proneness form a complex and interrelated set of variables.

#### SOCIAL STATUS AND ACADEMIC FACTORS

Social status scores were compared with intellectual and achievement factors to determine their influence in the social structure of the classroom. Intelligence quotients ranged from 108 to 174 with a mean I. Q. of 133. Analysis revealed no distinctions between Area I ( $M = 137$ ); Area II ( $M = 127$ ); and Area III ( $M = 134$ ). Reading age was selected as a sample achievement factor and likewise revealed no relation to the social pattern: Area I ( $M = 10.4$ ); Area II ( $M = 9.5$ ); Area III ( $M = 9.11$ ). Reading ages ranged from 8-1 to 13-1 with a mean R. A. of 9-11. The mean scores for the three areas on the sociogram would indicate that *brilliance and high achievement are random elements in the social pattern of this particular group*, bearing in mind that there are no real non-achievers in the group.

#### INJURY-PRONENESS AND OTHER FACTORS

A comparative analysis of the injury scores and the intelligence and achievement factors of the second grade revealed no systematic relationship. The teachers' ratings of pupil adjustment, Haggerty-Olson-Wickman Behavior Rating Schedules A and B (3), showed some relationship to the injury

pattern: Schedule A showed no trend; but, Schedule B distinguished slightly between the most frequently injured children (Med. R = 10.5) and the least frequently injured children (Med. R. = 14). The teachers' ratings of the Conrad Behavior Inventory items (6) were of some prognostic value.

The children's ratings on self-adjustment, Fuller Affectivity Interview Blank (2), did show a systematic relationship to the injury pattern. The less happy children received more injuries than the happier children.

It has been shown in Figure IV that higher Affectivity scores tend to accompany social popularity. Higher Affectivity scores also characterize low injury incidence. Thus the happiest children are apt to be found in the socially preferred and non-injury-prone group.

#### SUMMARY AND CONCLUSIONS

The twenty-two children enrolled in the second grade of the University of Minnesota Elementary School were selected for group study primarily because they had received an unusually high number of injuries during their second grade experience, and secondarily because their third grade teacher believed the social structure within the group was monopolistic and undesirable.

A concurrent study in injury-proneness in children provided complete records of first aid referrals. Analysis of first aid records revealed that the group under observation had received five times as many injuries as any other grade in the same school. A large proportion of the injuries involved conflicts with other children.

A general trend was discernible in that the less popular children; the "fringers", received more injuries than the socially accepted children. It was indicated that the more preferred children tended to have more injuries of a non-social nature (not involving other children) and the socially rejected children seem to have relatively more social injuries (those involving other children). The classroom teacher's claim of an undesirable social pattern in the group seemed to be substantiated by a few children: A, B, C, D, E, and F were chosen repeatedly; too many children, R, S, T, U, and V were chosen hardly at all. Mutuality of choices was limited to a relatively small number of children.

Personal adjustment and behavior problem tendency of pupils was considered sociometrically. Pupil adjustment was determined both by the testimony of children and by the judgment of teachers. Data was presented which suggested decreasing personal adjustment and increasing behavior problem tendency as children approach "fringe" or "unchosen" social status.



Measurement data and conferences with school personnel provided additional information on personal adjustment and academic achievement. Chronological ages, reading ages, reading quotients, and intelligence quotients were analyzed to determine their influence on social status and injury incidence. Although the experimental group was superior in general development, the individual children revealed a wide range of ability within the group, and neither intelligence nor achievement showed any systematic relationship to social structure or injury distribution in the second grade. The socio-economic background of the children was also superior; only the upper strata of socio-economic status, the first three classes on the seven-point Minnesota Scale for Paternal Occupations (4), were represented in the group. However, group homogeneity cannot be claimed in any attribute except chronological age: although the children were superior in general development and socio-economic status, they represented a wide range of ability and adjustment within their own group.

All interpretations must be made with full recognition of the limiting factors of the study: the twenty-two children in the experimental group represent a small, highly selective, superior segment of the general school population. In spite of the limitations, this study of injury-proneness and personal adjustment in a second grade reflects many of the same problems found in a more typical school population. Although the general school population represents all ranges of ability and adjustment, identification of self-status is relative to a specific school group. For practical purposes, therefore, the wide range of ability and adjustment revealed in the study group resembles a more typical school population to the extent that individual children within the group represent "high" and "low" level contrasts of ability and adjustment.

It is probable that a hypothetical slow-learning child of Paternal Occupation Class VII (4) who lives in a poor neighborhood would be a "fringer" if he entered this second grade. However, it might be hypothesized that since all of the children in the study were bright, somewhat over-privileged, achieving children, the differences revealed in the areas studied may be even more significant and the trends more emphasized if a broader range of attributes were present. The suggestion emerges, then, that similar investigations should be made with other groups of children in different locales under different types of supervision to test the hypothesis that the phenomena observed in the experimental group are not unique therein, and the selective factors apparent in this study may operate to reduce rather than emphasize the relationships described.

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Although the group under observation behaved as described in the study, there were a few children within the group who ran counter to the trend more often than with it. One boy who received the highest injury score in the group was in the upper third of the friendship choices and was rated highest of all the children in behavioral adjustment by his teacher. One girl who earned the highest score on the happiness test received one second choice in friendship and one non-social injury. Thus, when individual children are being considered, it is necessary to look further—to use more of a case study approach to increase understanding. This conclusion is in accord with suggestions from an earlier study of injury-proneness in nursery school children (1) in which both desirable and undesirable traits were found in injury-prone children, and the factors which seemed most influential in determining the proneness were the *combination* of traits and the *circumstances* under which they were functioning.

The cleavages within the second grade social pattern and their relationships to the injury and adjustment patterns of the children provide many suggestions for further study of injury-proneness and personal adjustment as a GROUP as well as an individual phenomenon. The group approach of the present study provides the challenging lead that group composition is undoubtedly an additional factor of importance in the injury-proneness syndrome.\*

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\* Another suggestive article is a Sociometric Study of injury proneness in industry which is contained in the *Journal of Clinical Psychology*, Jan. 1952, p. 89-91, "Steel Mill 'Hot Strip' Accidents and Interpersonal Desirability Values", by Boris Speroff and Willard Kerr. This hypothesis should be followed up in the Armed Forces (Ed.).

## AN ANALYSIS OF SOCIAL REJECTION IN A COLLEGE MEN'S RESIDENCE HALL\*

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*The problem.* Taking the cue from Moreno and associates in the statement that, "The most elusive problem up to date has been the measurement of rejection," (11, p. 16) the general problem which this study was designed to answer in part is: What is the nature of social rejection? As limited by the site and design of the study, the problem more specifically is: What are some factors significantly associated with those individuals most highly rejected by their peers among the 639 residents of Abbot Hall, a residence hall for men at Michigan State College, during the winter term of the 1949-50 academic year?

*The literature.* A review of the literature seems to justify the following hypotheses: 1) rejection is characterized by non-participation in extra-curricular activities (1; 7, p. 493; 8, p. 204); 2) rejection is positively associated with low prestige status (5, p. 260; 14, p. 220); 3) rejection is positively associated with being a lower classman (15, pp. 28-9); 4) rejection is positively related to poor home adjustment (6; 18); 5) personality characteristics are the most important characteristics determining rejection (2; 4); 6) rejection is positively correlated with academic failure (1; 3; 8, p. 204); 7) rejects disrupt group harmony (14, pp. 225-7); 8) rejects are likely to be egocentric (9, p. 134; 10, p. 335; 12; 13; 14, pp. 225-7; 16, p. 37; 17, p. 45); 9) the behavior of rejects is compensatory for inner frustration and is often aggressive (9, p. 134; 10, p. 335; 12; 13; 14, pp. 225-7; 16, p. 37; 17, p. 45); 10) an individual's rejection status is likely to be the same in different but similar groups (9, p. 205; 13, p. 139); 11) behavior leading to or accompanying rejection is positively related to lack of security (9, p. 134); and this study was designed to test in part, among others, all but number 10 of these.

*Hypotheses.* Based upon the literature, social and psychological theory, and the experiences of the investigator, the following hypotheses, sub-hypotheses and criteria of measurement were structured as bases of the study:

- I. Rejection is associated with those individuals who are identified by their

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\*(A summary of a Doctor's dissertation of the same title, Michigan State College, East Lansing, 1951)

peers as strange, different, atypical, or lacking in prestige at the time they become group members.

- A. Rejection is associated with those individuals whose past experience has produced values, appearance, or behavior identifiable by the group as different. Measurable evidence of such differences may be revealed by:
    1. atypical race;
    2. atypical nationality;
    3. atypical religion;
    4. atypical community background;
    5. atypical family relationship.
  - B. Rejection is associated with those individuals who are characterized by prestige-detracting traits, including:
    1. relatively low chronological age;
    2. relatively low college classification;
    3. relatively low occupational category of the father;
    4. relatively low family income.
- II. Rejection is associated with those individuals who, through inability or lack of motivation, fail to comply with the group's expectations of acceptable behavior, and which may be attributed to a deficiency in role-taking.
- A. Rejection is associated with those individuals whose interaction with other group members is relatively restricted. Measurable evidence of such restricted interaction may be revealed by:
    1. low leadership-prestige status in the group;
    2. selecting relatively few others as friends;
    3. rejecting relatively few others as friends;
    4. participating in relatively few spectator and extra-curricular activities;
    5. taking on relatively less part-time employment where such employment brings one into proximity with considerable numbers of one's peers;
    6. being rated lower by themselves and Resident Assistants on participation in dormitory affairs;
    7. being rated lower by themselves and Resident Assistants on over-all social participation.
  - B. The self-images of the most rejected individuals are likely to be inaccurate in terms of the group judgment, as evidenced by:  
(self-image)
    1. a feeling of being rejected by one's peers;
    2. a feeling of being deficient in:
      - a. scholastic effort;
      - b. over-all social participation;
      - c. participation in the affairs of the group;
      - d. social and personality adjustment;
      - e. citizenship.

(group judgment)

1. the extent to which the group rejected the most rejected individuals;
2. the extent to which the group considered those most rejected to be deficient in:
  - a. scholastic effort;
  - b. over-all social participation;
  - c. participation in the affairs of the group;
  - d. social and personality adjustment;
  - e. citizenship.

- C. The most rejected individuals' behavior is often typical of reaction to frustration, that is, it is likely to be aggressive and/or withdrawing, as evidenced by:
1. relatively low academic achievement in relation to ability;
  2. relatively frequent changes of residence and/or drop-outs;
  3. admitted feelings of insecurity;
  4. low rating by selves and Resident Assistants on scholastic effort;
  5. low rating by selves and Resident Assistants on citizenship;
  6. low rating by selves and Resident Assistants on social and personality adjustment;
  7. being characterized by one's peers as being aggressive and/or withdrawing in his interpersonal relations;
  8. case studies of some of the most rejected individuals.

*Methodology.* A Moreno type of sociometric questionnaire was administered to the 639 residents of the hall under an aura of demonstrated sincerity and anonymity of the respondent of which 94% were returned. In the questionnaire the following information was requested: 1) the names of one's best friends with desirability as a roommate being the criterion; 2) the names of those one would be most reluctant to accept as friends; 3) the names of those one would most prefer as Resident Assistant (a student administrative functionary in charge of from 50-75 students in a section of the residence hall); 4) the names of those one would least prefer in that capacity; 5) reasons for rejecting those under 2) above; 6) race; 7) state or country if other than U. S. in which one was reared; 8) college classification; 9) father's occupation; 10) approximate income of family during previous year; 11) size of community in which reared; 12) religious preference; 13) parents, step-parents, etc. lived with before entering college and how long; 14) age; 15) grade-point average; 16) expectation of being selected and rejected by others; 17) degree of security in feeling about the future.

Ratings by selves and Resident Assistants on points used in the study

along with information about spectator and extra-curricular activities were obtained from the Annual Men's Residence Reports. Other information needed was obtained from college records.

From the questionnaire returns each resident was assigned a friendship score and a leadership score. In each case the score equalled the number of times chosen minus the number of times rejected. Seeking approximately 100 from each extreme of such a distribution to serve as selects and rejects the nearest feasible numbers were 96 rejects and 102 selects. These groups were then compared on various traits, through the application of the Chi square technique, in order to detect those ways, if any, in which they differed significantly.

*The evidence.* The evidence of the first or background hypothesis may be observed in Table I. The subhypothesis that atypicality was associated with rejection found support. Rejection, as distinguished from selection, was significantly associated with being from an atypical regional background—particularly foreign nationality—and being from a city of more than 100,000 population as well as ethnic atypicality as represented by a combination of atypical regional and religious background.

The group was so predominantly Caucasoid that race is considered to have been inadequately tested. Atypicality of family relationship as related

TABLE I  
SUMMARY OF RELATIONSHIPS BETWEEN REJECTION AND BACKGROUND FACTORS

<i>Factor</i>	<i>Evidence</i>	<i>Rejection apparently related to</i>
College classification	p .05—	Lower classman
Community background	p .05—	City of more than 100,000
Regional background	p .05—	Foreign nationality
Religious preference	p .1+*	Other than Protestant or Catholic
Ethnic type (composite of two above)	p .05—	Foreign ethnic type
Parental relationship	p .2—*	Living with other than two natural parents
Parental relationship	p .2—*	A childhood change of relationship
Age	p .1+*	Less than 21
Occupation of father	no relationship indicated	
Family income	no relationship indicated	
Race	no relationship indicated	

\* not significant

p is probability of occurring through chance alone; .05 or lower considered significant.

to rejection failed to stand the usual test of statistical significance though such would have occurred through chance alone approximately one time in five.

Of the four prestige-detracting traits studied, only being a lower classman was significantly associated with rejection as opposed to selection.

The tests of significance of the various criteria used to measure evidence on the second, or behavioral, hypothesis are presented in Table II. The tabulation of reasons for rejection given by the rejectors are in Table III. The subhypothesis that rejection is associated with restricted interaction found support to the extent that rejection was significantly associated with 1) low leadership-prestige status; 2) restricted rejection and selection of others;

TABLE II  
SUMMARY OF RELATIONSHIPS BETWEEN REJECTION AND BEHAVIORAL FACTORS

<i>Factor</i>	<i>Evidence</i>	<i>Rejection related to</i>
Leadership-prestige status	p .001—	Low status
Rejection of others	p .01—	Few rejected
Selection of others	p .001—	Few selected
Spectator and extra-curricular activities	p .001—	Few activities
Part-time employment	p .05—	Unemployment
Participation in dormitory affairs <sup>3</sup>	p .001—	Little participation
Participation in dormitory affairs <sup>4</sup>	p .001—	Little participation
Over-all social participation <sup>3</sup>	p .02—	Little participation
Over-all social participation <sup>4</sup>	p .05+*	
(evidence on restricted interaction)		
Expectations of selection	p .001—	Low expectation <sup>1</sup>
Expectations of rejection	p .2—* <sup>2</sup>	
Scholastic effort	p .2—* <sup>1</sup>	
Participation in dormitory affairs	p *1	
Over-all social participation	p *1	
Citizenship	p *1	
Social and personality adjustment	p *1	
(evidence on inaccuracy of self-image)		
Grade-point average (ability constant)	p .01—	Low average
Moves and drop-outs	p .001—	Moving and dropping out
Security-insecurity <sup>4</sup>	p .5+*	
Family income unknown	p .01—	Income unknown
Scholastic effort <sup>4</sup>	p .05—	Little effort
Scholastic effort <sup>3</sup>	p .5+*	
Citizenship <sup>4</sup>	p .1—*	
Citizenship <sup>3</sup>	p .1—*	
Social and personality adjustment <sup>4</sup>	p .01—	Poor adjustment
Social and personality adjustment <sup>3</sup>	p .001—	Poor adjustment
(evidence on frustration-insecurity)		

\* not significant; <sup>1</sup> accurate self-image; <sup>2</sup> inaccurate self-image; <sup>3</sup> Resident Assistant rating; <sup>4</sup> self-rating; p is probability of occurring through chance alone—.05 or lower considered significant.



TABLE III

ARBITRARY COMBINATIONS OF MOST FREQUENT FREE-RESPONSE REASONS GIVEN FOR  
REJECTION IN ORDER OF FREQUENCY

1. Superiority role (Conceited, big-shot ideas, egotistical, overconfident, cocky, know-it-all, selfish, braggart, superiority complex, superior air, intrusive, social climber, extrovert, argumentative, sarcastic, spoiled, unreasonable, domineering, overbearing, must have own way, others always wrong, aggressive, belligerent, temperamental, bully, chip-on-shoulder) .....	231
2. Loud (Noisy, boisterous, prankster, talkative) .....	122
3. Inconsiderate (No regard for others, no respect for others, uncooperative) .....	84
4. Immature (Juvenile, childish) .....	57
5. Inferiority role (Unfriendly, timid, too quiet, independent, introvert, retiring, inferiority feelings) .....	48
6. Profane (Vulgar, crude, ill-mannered, low morals, loose morals, foul-minded, cursing) .....	40
7. Irresponsible, (Untrustworthy, unreliable, two-faced, sly, untruthful) .....	28
8. Untidy (Insanitary, unclean, slovenly) .....	22
9. Pessimist, (Griper, complainer, moody) .....	18
10. Odd (Screwy, silly, simple, sex-crazy, naive, helpless, narrow, straight-laced) .....	14
11. Effeminate (Affected, girlish) .....	11

3) restricted spectator and extra-curricular activities; 4) restricted part-time employment which brings one into contact with group members; 5) low rating on group participation by selves and others; 6) low rating on over-all social participation by others.

The second subhypothesis to the effect that rejection is associated with those holding inaccurate self-images was supported by only one of the criteria utilized, i.e., the rejects, as compared with the selects, were rejected significantly more than they stated they expected.

The subhypothesis to the effect that rejects are frustrated and insecure was supported by a significant relationship between rejection and 1) low academic achievement in relation to ability; 2) more frequent moves and drop-outs; 3) being ignorant of the family income. In addition, the tabulation of reasons given for rejecting others, as shown in Table III, points to egocentric, aggressive behavior as that most typical of rejects. An intensive study of the nine most rejected individuals offers further support to this proposition, in that those individuals were, in eight cases, most often described as conceited, loud, inconsiderate, etc., while one was considered to be primarily pessimistic and inferior in feelings.

*Conclusions and implications.* Of the background factors considered which might produce a rejected status through making an initial impression

on the group of being different or lacking in prestige, only being a foreigner in the national or ethnic sense and being from a city of more than 100,000 population were significantly associated with rejection as opposed to selection, as marks of atypicality, and being a lower classman as a mark of low prestige. While race was not adequately tested due to the nature of the population studied, and while unusual parental relationship as well as relatively low age approached statistical significance in apparent relationship, there was no indication that either low family income or low rated occupation of the father were related to rejection.

Among the behavioral characteristics examined, the following were significantly related to rejection as opposed to selection: 1) low leadership-prestige status; 2) restricted rejection and selection of others; 3) restricted spectator and extra-curricular activities; 4) lack of part-time employment; 5) self-rating and rating of observers on being restricted in participation in the affairs of the group; 6) rating by observers as being restricted in over-all social participation; 7) inaccuracy of self-image in expecting less rejection than received; 8) low grade-point average in relation to ability; 9) more frequent moves and drop-outs; 10) not knowing the family income; 11) rating selves low on scholastic effort; 12) being rated by selves and observers as poor in social and personality adjustment. In addition, a tabulation of the reasons given for rejection placed emphasis on ego-centric, inconsiderate, aggressive behavior most frequently, and withdrawing, odd, juvenile behavior generally second most important. A study of the nine most rejected individuals indicated that eight of them were primarily egocentric, inconsiderate, boisterous, etc., and one pessimistic and withdrawing.

Generally, then, it appears that rejection accompanies marked atypicality as to origin and belief systems and classification in a low local prestige rank—specifically, lower classman, and that many commonly held criteria of acceptability such as family income, occupation of father, were not applied in the group studied.

Personality traits which are typical of reaction to frustration and/or insecurity, i.e., aggression and withdrawal, were significantly associated with rejection. The reject appears to interact with group members less than does the select.

It may be concluded that marked atypicality results in an initial rejection by the group accompanied by barriers to interaction established both by the group in its ostracism and the individual in his different values and communicative handicaps which renders the gaining of acceptability more difficult than for the average group member.

Further, the reject appears to be maladroit in role-taking, failing to become completely aware of the group definitions and expectations, or, in the event this conclusion is unwarranted, he then must be either inept in his attempt to comply with group expectations or lack the motivation to do so.

For a counseling or advisory program in residence halls which seeks social acceptability for the individual as part of the educational product, the following implications seem to be justifiable:

1. In the case of foreigners and others from markedly different ethnic backgrounds:
  - a. attempt to bring them to a realization of the many differences likely to exist between their previous cultural values and the values of the culture in which they now find themselves;
  - b. suggest that the mark of an educated man is spontaneity and adaptability—that they may make certain adjustments to these different values without forever forsaking their earlier values to which they may return;
  - c. attempt to get over the idea that to really understand another individual and anticipate his actions and reactions, one must think as he thinks; therefore adjustment to the values of a group and the individuals therein necessitates taking on the roles of various individuals within such a group;
  - d. show that effective role-taking is essentially a communicative process, a matter of interpersonal relations of a sympathetic sort; that to effectively put oneself in another person's place one must at least temporarily abandon bias, prejudice, dogma, and *a priori* answers;
  - e. explain that being thwarted in attempting such a goal-response as gaining social acceptance tends to lead to frustration and reduce rationality to rationalization;
  - f. arrange situations, programs, activities, and conditions in so far as feasible to increase the sheer quantity of contacts by foreigners with more typical group members.
2. In the case of other rejects:
  - a, b, especially c, d, and e above, plus
  - f. calling their attention as the situation permits to the kinds of behavior typical of the most rejected persons, and how adjustment to norms of acceptable behavior in such a group constitutes a vital part of the educational process and is real preparation for successful living in American society.

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## A NOTE ON THE USE OF TARGET SOCIOGRAMS\*

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During the past eleven years many improvements have been made to my preliminary attempt to devise scoring and graphic methods in sociometry. Scoring on the whole has come to be worked out on a probability basis. However the contribution which has been most widespread is that of the target diagram. It has barged its way into various text books and been highly accepted in lay groups. Undoubtedly it is a picturesque means of symbolizing the sociometric structure of, and relationships in, a group.

The target's very popularity has meant that its limitations and inadequacies have tended to be ignored or excused. Indeed one has had the comment from a group of intelligent, interested, but scientifically naive teachers—"So that's our classroom; wouldn't it be fine if we could help children so that all of them would be in the center circle!"

### *Safeguards in Using the Target*

Two points should be remembered by those using target diagrams:

(1) It is an *abstraction*. Sociometry itself by employing a limited number of criteria and requiring a definite number of choices is an abstraction from the multitudinous permutations of social choice and relationships within a group. The target by depicting only the dominating choices (or else resulting in complete artistic confusion) is a further abstraction from the living situation. Before basing decisions on it one should always consult the original data; the less dominating choices may be as important for both scientific study and therapeutic use as those which are depicted.

(2) It is a *symbol*. To most people the diagram and the word target suggest the archery or rifle range; the assumption is that the purpose is to hit the "bullseye". It is popularly supposed that a higher sociometric score, reflected in position of nearness to the center of the target, is *directly* related to values of good mental health. This is by no means proven.<sup>1</sup> Indeed, while studies have shown personality differences to be related to sociometric level,<sup>2</sup> they have not demonstrated that high status is associated in a one to one

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\* The Target Diagram is a modification of Moreno's Sociogram (*Ed.*).

<sup>1</sup> Northway, Mary L. *Studies in the Field of Sociometry*, Univ. of Toronto Press, (mimeographed) see p. 34f.

<sup>2</sup> Northway, Mary L. and Wigdor, Blossom T. *Rorschach Patterns Related to the Sociometric Status of School Children*. *SOCIOMETRY* 1947, X: 2: 186-199.

relationship with indices of mental health value based on other criteria. It is true that individuals with continually low sociometric scores ("outsiders")<sup>3</sup> frequently show other forms of psychological or social difficulty; but this is not always the case.<sup>4</sup> The need for other criteria than position on the target to evaluate secure development must always be remembered.

#### *Extensions for Improving the Target*

1. In depicting the sociograms of a community formed of two or more sub-groups (boys, girls; negro, white; etc.) the target may be segmented scaled to the proportion of the sub-group in the total community; self preference scores indicated and inter-sub-group choices drawn.<sup>5</sup>

2. For depicting number of choices to or from a subject beyond his dominating ones which appear on the sociogram we have found the following device useful. Each subject is placed on the target as usual, with a circle or triangle. Each additional outgoing choice is placed with a small arrow outside his circle; these point to the center of the target if they go to people of higher sociometric status; to the circumference if to individuals of lower sociometric status. Each choice coming to him is recorded inside his circle. Thus his "emotional expansiveness" is depicted.

3. For comparing two sociograms of the same group obtained at different times it has been useful to draw the second on transparent paper which can be superimposed on the original. The changes in each person's status and dominating choices can be readily compared.

4. Obviously the target can be formed according to the statistical division the particular study requires. In studies contrasting cases of high and low sociometric scores we have found division into tertiles useful and based the target sociograms on these.

<sup>3</sup> Northway, Mary L. Outsiders, *SOCIOMETRY* 1944, VII: 1: 10-26.

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# SOCIOMATRICES AND LEVELS OF INTERACTION FOR DEALING WITH PLEURELS, GROUPS AND ORGANIZATIONS

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This paper is intended to show how concepts classifying people into levels as:

persons	(social elements)
plurels	(sets of persons)
groups	(plurels of interacting persons)
organizations	(groups of persons in roles)

can be operationally defined, quantitatively refined, and systematically interrelated by the use of sociomatrices.

## I. *Persons as Units, P<sup>0</sup>*

The fundamental entity of interest to social science is the individual human being capable of interacting with other human beings. Thus human individuals are the basic units from which we shall construct our interperson matrix or sociomatrix, and define the different types of human aggregates.

If we symbolize the population of people by P, then our units can be denoted by P<sup>0</sup> (people-to-the-zeroth power) since, algebraically, anything to the zeroth power equals unity.

## II. *Plurels as Sums, P<sup>1</sup>*

People may have various characteristics in common with each other, or they may differ from each other in various ways. Thus we may subclassify the class "persons", P. A "plurel" can be defined as any set of people who have some characteristic in common which differentiates them from other people. This distinguishing characteristic may be a common political orientation as shared by the plurel, Republicans, for example; or a common hair pigmentation as shared by the plurel, redheads; or mere spatial propinquity as shared by "the people in this room".

Any plurel, then, is a *sum* of individual people having some common characteristic.<sup>1</sup>

<sup>1</sup> If the number of persons is denoted by P, then the plurel can be symbolized by any of the following alternative expressions which differ chiefly in explicitness of detailed to summary symbolizing.

$$\text{Formulas: } P \equiv P^1 \equiv \sum_1^P (1) \equiv \sum_1^P P^0$$

Such a sum can be regarded in matrix terms as an array, listing one person after another, either in a row or in a column (but not in both). It is a population-to-the-first-power,  $P^1$ .

### III. Groups as products, $P^2$

When the persons comprising a plurel interact among themselves, stimulating and responding to each other, they become a group. Interaction, of some specified kind, is what transforms a plurel into a group. Just as a plurel is the *sum* of the individuals comprising it, so a group is the *product* of the interactions of its members. Mathematically, multiplying a set of persons by a set of persons denotes social interaction so that a mathematical product of factors denotes a group of interacting persons.

The persons of any plurel, by interacting with each other, are psychologically "multiplied" by each other. At the plurel level, John Doe and Richard Roe are merely added together as, say, two men who speak English. But when they interact by speaking to each other, the resulting group (a dyad) is more than just John Doe plus Richard Roe; it is the product of which these persons are the factors; it is a pair speaking English together.

A group may be analytically symbolized in a cross-tabulation or matrix by putting the same array of people on two axes, where one axis denotes actors and the other denotes the same persons as reactors, and each cell of the resulting matrix is the product of the row and column persons. This may be viewed as the logical product of logicians since it is the class of things pertaining to the actor and the reactor jointly.<sup>2</sup> Since it is not necessary that each person interact with all of the others, some of the cells in the matrix could just as well be empty; or they might represent any degree of

$$\begin{aligned}
 P &\equiv P^A + P^B + P^O \dots + P^P \\
 &\equiv \text{John plus Henry plus Tom} \dots \text{plus Dick} \\
 &\equiv \text{a set of persons} \\
 &\equiv \text{a sum of } P \text{ persons of one kind} \\
 &\equiv \text{a plurel}
 \end{aligned}$$

Any particular plurel may be named by a subscript such as  $P_A$  meaning the A kind of persons if this is needed to identify it. Let the pre-superscript,  $AP$ , name a person, while the post-superscript,  $P_A$ , names a plurel.

<sup>2</sup> A single product of two persons, called a pair, may be symbolized by writing this scripts jointly as in  $P^{AB} = P^A \times P^B$ .  $P^O$  equals 1; with one script, it denotes a person as the unit ( $P^O = 1$  person); with two scripts it denotes a pair, or elemental group, as the unit ( $P^{AB} = 1$  pair).

interacting (of the one kind to which each matrix is limited); it still would be a 2-matrix, people-to-the-second-power, a group.<sup>3</sup>

<sup>3</sup> In more mathematical language: If  $P$  denotes a person,  $A_P^o, B_P^o, C_P^o$  etc., being names for persons,  $A, B, C$ , etc., and if  $A_P^o + B_P^o + C_P^o + \dots + P_P^o = \sum_1 P^1$  denotes a plurel, a sum of persons, an array of a matrix, then:

$(\sum_1 P^o) (\sum_1 P^o) = P^1 \cdot P^1 = P^2$  denotes a group, a product of two plurels, a 2-matrix. In expanded algebraic form:

$$A_P^o + B_P^o + \dots + P_P^o (= 1 + 1 + \dots + 1 \text{ to } P \text{ terms}), \text{ times:}$$

$$A_P^o + B_P^o + \dots + P_P^o (= 1 + 1 + \dots + 1 \text{ to } P \text{ terms}), \text{ gives:}$$

$$\begin{aligned} & \begin{matrix} AA^o & AB^o & & BB^o & BA^o & & PA^o & PB^o & & PP^o \\ P & P & & P & P & & P & P & & P \end{matrix} + \dots + \begin{matrix} BB^o & BA^o & & PA^o & PB^o & & PP^o \\ P & P & & P & P & & P \end{matrix} \\ & = 1 + 1 + 1 + \dots + 1 \text{ to } P^2 \text{ terms} = P^2. \end{aligned}$$

Since every person is unity ( $P^o = 1$ ) and every pair of persons or product of two persons ( $A_P^o B_P^o = AB_P^o = 1$ ) is also a unity, the terms,  $P^2$  in number, in the product of a plurel with itself add up to  $P^2$ .  $P^2$  then is a suitable mathematical symbol for a human group. It can summarize the kinds and amounts of interacting of its members. The algebraic product of two plurels above may be written in still more expanded form as a matrix of logical products as follows:

	$A_P^o$	$B_P^o$	...	$P_P^o$
$A_P^o$	$AA_P^o$	$AB_P^o$	...	$AP_P^o$
$B_P^o$	$BA_P^o$	$BB_P^o$	...	$BP_P^o$
...	...	...	...	...
$P_P^o$	$PA_P^o$	$PB_P^o$	...	$PP_P^o$

$$\left( \sum_{X=1}^{X=P} P_X^o \right) \cdot \left( \sum_{X=1}^{X=P} P_X^o \right) = ||XX_P^o||$$

in expanded notation, or

$$[P^1 \cdot P^1 = P^2]$$

dimensionally, i.e., considering exponents only

Whenever, then, cross-tabulation in a matrix, rather than simple enumeration in an array, is necessary to depict the situation, we are confronted with a group instead of a simple plurel, or  $P^2$  instead of  $P^1$ .

#### IV. Organizations as Powers of Persons, $P^3$

The next level of matrices, involving three axes, can be used to define operationally an organization of people. We begin from the concept of an organization as "*a group having integration of differentiated interaction and members.*" The differentiated behavior of a person in an organization may be called broadly his *role* in that situation. Within the homogeneously interacting group of friends who eat together, an organization develops when persons differentiate in roles.

The roles may be formalized as offices with officials called a chairman, a secretary, etc. The roles may be informal expectations based on habitual behavior such as the role of most talkative, funniest, dullest person, etc. Roles may grow up almost unnoticed as in the role of being the youngest child in a family or may be carefully defined as in a job analysis itemizing the duties of a person in some occupational role. Differential behavior, whether of a dominating type in leadership, or an exchanging type, or a specializing type, or any other type which contributes to the whole organization, is included in this concept of role. Roles may be thought of as behavior expected of a person in a group-defined situation largely because it is habitual behavior for people in that situation. We believe that any kind of differentiated interhuman relation within an organized group can be re-expressed as a "role" and entered in some appropriate cell of a suitably defined matrix

Each cell of the matrix contains  $XX P^0$ , as a factor stating that whatever entity or quantity is written in that cell it is an entity or quantity pertaining to the row and column persons. The  $XX P^0$  is a logical class making a logical product with any entity written in the cell. The  $XX P^0$  qualifies the cell entry or names it as the cell of its row and column. Any value of a statistical index ( $I$ ) of the amount of interaction of one kind may be multiplied by the cell entry and the product denotes an amount  $XX I (=I : XX P^0)$  pertaining to the row and column pair of persons.

Note the usefulness of the zero exponent in combining the qualifying that is stated by logical classes and sentences with the quantitative expressions of algebra. Both qualities and quantities are handled together by means of the zero exponent, when combined with suitable subscripts, according to the rules of ordinary algebra.

The kind of entity, "person", "pair of persons", etc., and numbers of them or amounts of their characteristics can thus be handled with equal rigor in unified expressions by means of the zero exponent.

It is evident that roles thus represent specialized interrelations between members of a group. (Interrelations include all interactions which are the dynamic subclass of interrelations.) To be an organization the group with its roles must have some unity or perform some one function such as a factory which makes automobiles.

The matrix is a technic for spelling out the roles by providing a cell for each person in each role. These role cells can make a third axis perpendicular to the two axes of the group in the matrices described above. If a simple group's two axes cross-tabulated on one "page" are called the actors (heading the rows) and their reactors (heading the columns), then the third axis might be called the role-actors (heading the pages). Then the cells on "page A" would record the direct interrelations of one kind between the actors and the reactors (who may be the same or a different set of persons). Then let "page B" represent the interrelations of the group in terms of one member's role, let us say, as foreman of a work group. The cells in the first row and column of "page B" interrelate the foreman as foreman with each actor and reactor in the group. The corner cell in "page B" relates the foreman as foreman to himself as non-foreman. Each other cell in "page B" provides for recording the interrelation, if any, between an actor and reactor as influenced by the foreman. By comparing the two pages one can tell how the actor and reactor behave differently on "page B" *because of the foreman* than they did on "page A" when unaffected by the foreman.

This matrix scheme can provide a "page" (*i.e.*, a cell on the role axis for any and all possible roles including multiple roles of one person or role of a subset of persons such as of a committee or a department, etc. The cells, then, provide a place to record (and compel more exact and reliable observing thereby) every possible interrelation of persons and persons-in-roles, and all their combinations. The third axis *repeats* the listing of the members (in part or entirely) according as each member's interacting is differentiated by some role or formal office or custom-expected behavior when interacting with others. This "role axis" can provide for all possible differentiations of interaction within any group by assigning each differentiation a cell on this axis (which becomes a "page" when expanded by the first two axes of the group).

Syndromes of differentiations can form sections of such matrices and can be summarized by bordering arrays which cross-tabulate any persons against persons-with-syndrome A, etc. The most inclusive syndrome is the whole organization. Thus the outermost arrays of a matrix, whether of a group or of an organization, can always deal with the interrelations of any

parts with the whole. The outermost corner of the matrix would express a relation of the whole to itself as when an organization decides to change its name. Summarizing indices, appropriately defined, especially from these outermost arrays, can measure degree of integration of the organization. The matrices thus arrange their interrelations of people in orderly ways as basic data for computing indices of action or of static relation at any level. Even though most of the cells may be empty, the matrix specifies just which of the potential interrelations have been observed in a given set of data.

For one example of how the matrix can help to measure the degree of organization of a group consider a community. Its members specialize on different occupations, exchanging their products. The limit of this differentiation of labor is when every person is a specialist of a unique kind. The matrix will then show one different kind of occupational service index in each array. A summary index can measure the degree to which each array is pure or is mixed with indices of other arrays—and so measure the degree of organization in this occupational respect as a percent of its maximum.

These three axes are taken as factors in an algebraic product which expresses mathematically their psychological interactions or products. The axes might be named the "actor axis" as in plurals, the "reactor axis" which defines a group, and the "role axis" which defines an organization. This asserts that a human organization is at least "people-to-the-third-power." This means it is a product of people repeated in three ways; once as actors, again as reactors to each other, and again as role-actors.<sup>4</sup>

In Sociology an important special case of organization is the institutional organization—familial, scholastic, economic, political, religious, etc. Here the three chief sets of interactors are the public, the "agents" or specialists (such as parents, teachers, producers, officials, clerics, etc.) and the "clients" (such as children, pupils, consumers, citizens, laymen, etc.). Here the public can be written in the actor array of the matrix and often may need only its summarizing cell for the whole people. It is observed in any poll which is a representative sample of the public. The institutional

<sup>4</sup> Calling these three factors,  $P_P$ ,  $P_Q$ , and  $P_R$ , respectively, we can write the formula as:

$$(\Sigma P_P^0) (\Sigma P_Q^0) (\Sigma P_R^0) = P_P^1 P_Q^1 P_R^1 = P^3 \text{ an organization}$$

Dimensional formulas in Physics and in Sociology state the relations between basic factors (i.e., asserting them to be a *sum of products of powers of the factors*) without regard to the absolute size of the units. Thus the dimensional formula  $P^2$  or  $P^3$  means that a population is taken twice or three times as a factor even though each factor may be numerically different.  $P^2$  means a product of two  $P$ 's in dimensional formulas and not necessarily one  $P$  times itself.



agents are those persons from the public who are repeated in their roles as specialists in carrying on the institutional interactivities. They may be listed along the role axis as role actors. The clients are again a part of the public who are explicitly repeated in the matrix as reactors with the agents. They may be listed along the reactor axis. Then the 3-matrix of the public, agents, and clients as the actor, role-actor and reactor factors, respectively, can spell out all the possible interhuman relations that constitute the institutional organization.

All possible relations among the human parts of the organization can be recorded in matrix form. The matrix is only one possible definition and arrangement out of many. And within matrices, instead of three axes, either two axes or four or more could be used. For two axes, the roles could all border the matrix of actors and reactors making a very large and unwieldy 2-matrix. Or again the first role of each person could compose the third axis and second roles could compose a fourth axis, *tec*. Both of these arrangements, we believe, are more complex in practice than arraying organizational relations along the three axes of actors, reactors, and role actors. In short, organizations require at least three axes as a minimum, but may have any number more.

In summary, matrices seem a simple, comprehensive, standardizable and reliable way of operationally defining the terminology of groups and organizations so as to increase their observability and predictability.

The sociomatrix puts the chief possible relations among people in society into a form which can be operated upon mathematically. The mathematical powers of people, or levels of interacting, may now be summarized in a generalized exponent script, thus:

$$P^P = \begin{pmatrix} P^0, \text{ a person} \\ P^1, \text{ a plurel} \\ P^2, \text{ a group} \\ P^3, \text{ an organization} \end{pmatrix} \quad \left( \begin{array}{l} \text{the dimensional powers} \\ \text{of people} \end{array} \right)^5$$

<sup>5</sup> The dimensional powers of people here are but one sector out of five sectors in our comprehensive dimensional formula for systematizing the social sciences. (Rfs. 6, 7, 11, 16). The five sectors (or classes of dimensions, or basic factors in human data) most used in this system are time, space, people, desire and the complement class. The dimensional formula, defined essentially as a *sum of products of powers of basic factors* is:

$$S = \Sigma T^i L^j P^k D^l I^m$$

These may be expanded by their chief powers to suggest their meaning as follows:

### V. Matrices for Predicting Interaction

The question is often asked: Does dimensional analysis, such as the foregoing, only describe and classify social phenomena or can it also help to predict them? Can it go beyond classifying people by levels of the exponent corresponding to levels of interaction as plurels, groups, or organizations? Can it develop new relations or insights? new hypotheses or tests for them? new induction or deduction of laws? new principles for better prediction and control of any social phenomena?

We believe dimensional analysis can be a creative tool. We offer two bits of evidence here.<sup>6</sup> One is the deduction of the logistic growth curve; the other is the deduction of the formula for interactance or demographic gravitation. Both deductions are gathering a weight of empirical confirmation which may class them in the future as social laws.

Dimensions Subclassified by powers → by sectors ↓					
	Nullity X <sup>-oo</sup>	Quality X <sup>o</sup>	Quantity X <sup>1</sup>	Relation X <sup>2</sup>	System X <sup>3</sup>
Space L	L <sup>-oo</sup> = no space	L <sup>o</sup> = point	L <sup>1</sup> = line	L <sup>2</sup> = area	L <sup>3</sup> = volume
Time T	T <sup>-oo</sup> = no time	T <sup>o</sup> = date	T <sup>1</sup> = duration T <sup>-1</sup> = speed	T <sup>-2</sup> = acceleration	T <sup>-3</sup> = evolution factor
*People P	P <sup>-oo</sup> = no people	P <sup>o</sup> = person	P <sup>1</sup> = plurel	P <sup>2</sup> = group	P <sup>3</sup> = organization
Desire D	D <sup>-oo</sup> = no desire	D <sup>o</sup> = kind of desire	D <sup>1</sup> = amount of desire	D <sup>2</sup> = correlation of 2 desires	D <sup>3</sup> = system of desires
Other Indices I	I <sup>-oo</sup> = no index	I <sup>o</sup> = qualitative index	I <sup>1</sup> = quantitative index	I <sup>2</sup> = correlated indices	I <sup>3</sup> = systemic indices
Any sector	zero	a class	a variate	a correlation	a formula

\* Array studied here.

Our dimensional analysis, which this paper describes a bit, tries to re-express the data, the concepts, and the principles of the social sciences in dimensional formulas compounded out of the sectors and their powers above together with their other scripts and with the logical and mathematical signs for the operations upon the other symbols.

<sup>6</sup> See Refs. 6-17 for further evidence of the uses of dimensional analysis.

To deduce the logistic growth curve take the interaction matrix where each of a set of  $P$  persons are cross-classified against each other. Let the cell record a 1 or a 0 according as the row person acts on or does not act on the column person. The interact might be telling a rumor for example. Let  $p$  denote the proportion of persons or section of the matrix who know the rumor and  $q$  denote the rest. (So  $p + q = 1$ ) Let all the people interact or talk to each other with equal probability mathematically or effectively equal opportunity socially. The social interacting is denoted mathematically by multiplying the set of persons by themselves ( $P + P = P^2$  dimensionally). So we multiply together the two proportions of knowers of the rumor and non-knowers, as follows:

getting 
$$p^2 + 2pq + q^2$$
 which represent four quadrants of the matrix.  $p^2$  represents the proportion who know the rumor talking to each other—with no increase in the number of knowers.  $q^2$  represents the proportion of non-knowers talking with each other—with no further spreading of the rumor.  $2pq$  represents the proportion of knowers and non-knowers talking together which is where the rumor grows.  $2pq$  then represents the most probable increment of knowers in a unit period. On adding up (or integrating in calculus) these  $pq$  increments for successive periods the logistic S-shaped curve results, namely:

$$p_t = \frac{p_0}{p_0 + q_0 e^{-kt}}$$

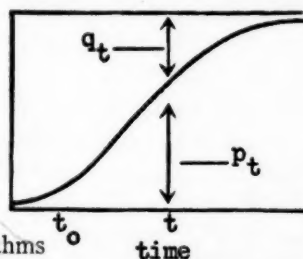
$t$  = any time

$t_0$  = starting time

where  $p_t$  = proportion of knowers at

$e = 2.718$ , the base of natural logarithms

$p$   
% of  
people



$k/4$  = a constant, the slope at the midpoint and middate, which shows the general speed of growth.

This curve predicts that, under conditions of equal opportunity, the all-or-none rumor will spread slowly at first, then faster, then slowly again as only a few hard-to-reach people remain. Its parameters,  $p_0$  and  $k$  tell the rate of growth at any moment relative to the total period and total population eventually told. This mathematical deduction from the dimensional definition of a group as  $P^2$  leads to expecting or predicting a logistic growth for an all-or-none act whenever relevant opportunities to interact are equal.

Hornell Hart's findings of logistic spurts of cultural growth of many kinds and the Pearl-Reed curves of population growth are the sort of empirical evidence that tends to confirm this deduced expectation or logistic hypothesis. (Ref's. 17, 19, 20). Such empirical evidence shows when the mathematical logistic law "holds" or fits social data. Such evidence shows how homogeneous the conditions for growth were in the observed social situation.

Another example of deduction from the interaction matrix is the interactance hypothesis which is also called the principle of demographic gravitation. (Ref's. 3, 12, 14, 16, 30).

This principle (which seems to this author to be likely to become established as a basic social law) states the amount of interaction expected between two groups. This might be the amount of telephoning between cities, or migrating between states, or intermarrying between occupational classes, or communicating news between concentric zones outward from the center, etc., etc. The amount of interaction ( $I_{PP}$ ) expected in a period ( $T$ ) is proportional to the product of the number ( $IP$ ) of acts of each group divided by their intervening distances ( $L$ ).

$I_{PP} = k I_A P_A I_B P_B T L^{-1}$  = the interactance, where  $k$  is a constant for each kind of interaction,  $P_A$ ,  $P_B$  are the number of people in groups  $A$  and  $B$ , and  $I_A$ ,  $I_B$  are the per capita activity of each group. Whenever this per capita activity cannot be observed, approximate weights for each group may serve; if no weights are written, unit weights are implicitly used.  $k$  is the reciprocal of the number of acts in all groups; it is the probability of one act,  $k = 1/\Sigma IP$ . In practice it may also contain another factor adjusting for the size of the units used in the other factors.

This expected amount of interaction, called the interactance, is deduced from the interaction matrix whose rows and columns represent frequencies of acts among the groups. The relative cell frequency is expected by the law of joint probability to be proportional to the product of its row and column relative frequencies. This may be tested by expecting the interaction matrix to be a contingency table with a contingency coefficient of zero. In short, the interactance formula states the most probable amount of interacting (when the distance and time factors are also allowed for). The interactance hypothesis then asserts that the expected interactance will agree closely and reliably with the observed interacting within each pair of groups. The mounting evidence (Ref's. 3, 12, 14, 30) of close and good fits is tending to confirm this hypothesis as a scientific law of human interaction. Here again the interaction matrix, when probability principles are applied to it, permits deducing and predicting an important social principle.

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These two examples of new relations deducible from dimensional analysis may be but a foretaste of a richer banquet awaiting researchers who use such analytic tools.

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## LEOPOLD VON WIESE CELEBRATES HIS 75TH BIRTHDAY

On December 2nd, 1951, Leopold von Wiese, Professor of National Economics and Sociology at the University of Cologne, celebrated his 75th birthday.

Leopold von Wiese, the President of the German Society of Sociology, who is considered one of the foremost sociologists of our time, was honored by the University of Cologne at a special celebration. He received telegrams and congratulations from many countries. The University of Mainz (Faculty of Jurisprudence and Economics) conferred upon him the title of Dr. *Rer. Pol. Honoris Causa*. Thirty-two of his colleagues, friends and students collaborated on a special book for this occasion, in which they attempt to give a survey of the present state of research in sociology. A number of American sociologists also contributed to this volume. ("*Soziologische Forschung*", edited by Karl Gustav Spech, published by Westdeutscher Verlag, Koeln-Opladen, 1951, 352 pages.)

Leopold von Wiese is known by the readers of *SOCIOMETRY* for having spread sociometry in Germany as well as for having introduced sociodrama and roleplaying methods in his seminars. (See his contribution to the volume "*Sociometry in France and the United States*", edited by Georges Gurvitch and published by Beacon House.)

K. G. SPECHT,  
University of Cologne

Greetings of *Sociometry* to Dr. Leopold von Wiese.

To Leopold von Wiese, the pioneer of a Sociology of Interhuman Relations, the author of the "*System der allgemeinen Soziologie*", go the warm congratulations of sociometrists.

J. L. MORENO, *Chairman*,  
Editorial Board, *SOCIOMETRY*,  
A Journal of Interpersonal Relations  
and Experimental Design

LABORATOIRE DE SOCIOMETRIE ET D'EXPERIMENTATION  
PSYCHO-SOCIOLOGIQUE  
DE L'ECOLE PRATIQUE DES HAUTES ETUDES

*Research Program 1951-1952*

The Vith Section of Ecole Pratique des Hautes Etudes has agreed to sponsor a "Laboratory of sociometric research and social psychology experiments". An advisory board has been formed, composed of: F. BRAUDEL (Secretary of the Sixth Section); L. FEBVRE (President of the Vith Section); G. GURVITCH, G. LE BRAS, C. LEVI-STRAUSS, H. LEVY-BRUHL, M. MERLEAU-PONTY, and G. POYER.

A place is reserved to a member of the Institute of Psychology of the University of Paris and will be disclosed later.

Mr. Jean MAISONNEUVE assumes the role of "Secrétaire-Administrateur" of the Laboratory.

Work in this institution started on December 1st. Research workers working in this laboratory set out a research program for 1951-1952, centered chiefly on:

RESEARCHES ON SOCIABILITY PATTERNS

which may be briefly summarized as follows:

I. *Sociability patterns*

Under this heading the problem of interferences between interpersonal relations and collective data will be specially studied.

The *collective data* envisaged are:

- a)—Social structures and settings within which groups and sub-groups are located—sizes of group population ("*situational we's*")
- b)—Social collective patterns—group belongingness—intergroup tensions—roles ("*existential we's*")

*Interpersonal relations* is meant in a specific affective sense:

- a)—attraction links (sympathies, friendship)
- b)—Interpersonal conflicts (rivalries, antipathies)

On this basis the following problems will be specially investigated both on *field studies* and *laboratory experiments*:

With possible influences of collective data on interpersonal relations:

1. Influence of group size on group structure, on interpersonal links patterns, on leaders behavior.

2. Influence of group interests

The cultural, technical, social, political and leisure factors will be taken into account.

3. Influence of heterogeneous social statuses on contact groups (by comparison with homogeneous social groups): group cleavages, social distance, prestige effect, resistance to prestige, attitudes changes.

With possible influences of interpersonal relations on group dynamics:

1. Incidences of friendship on cooperation

(experimental insertion of psychogroups within sociogroups)—“germination test”.

2. Incidences on cooperation of rivalries and conflicts between members of a group and between group leaders.

3. Analysis of resistance to personal attraction when pressures force the group to divide itself.

Influence of resistance to personal attraction on group competition.

4. Analysis and experiments on neglected and isolated individuals aptitude to build up functional groups and affective groups (“meeting test”).

Particular attention will be paid to:

a)—*a series of sociodramas* “in situ”, following directly discussions among groups and centered upon: familial, economic, political, artistical problems related to the interests of the group and the suggestions formulated by the leaders.

Dr. Moreno’s technique of alternating roles will be used in some cases.

b)—*a series of “meeting tests”*, in the laboratory, dealing with the largest possible social and psychological scale. They will be used to throw light upon the possibilities and forms of communications between individuals of different classes, professions, interests and psychological make-up.

## ANNOUNCEMENTS

### *Moreno Institute, Spring and Summer Program, 1952.*

A catalogue for this period is available at the Moreno Institute, Beacon, New York. Copies will gladly be sent upon request.

### *Sociometry, Volume XIV, No. 4.*

The last issue for 1951 is now in press and will be forthcoming immediately after this issue. It contains articles by Howard Becker, Edgar Borgatta, Joseph Gittler, Henrik Infield, Margaret Altmann, J. L. Moreno, and others.

### *Books Received.*

*German Youth: Bond or Free*, Howard Becker, published by Kegan Paul, Trench, Trubner & Co., Ltd., London, England, in the International Library of Sociology and Social Reconstruction, Editor: Dr. Karl Mannheim, 1946; 286 pp., clothbound. "The most brilliant Sociological analysis of the German youth movement." (J. L. Moreno.)

*Research Methods in Social Relations*, Part 1 and 2, Marie Jahoda, Morton Deutsch and Stuart W. Cook, published by The Dryden Press, Inc., New York, 1951, 759 pp., clothbound. "It contains an outstanding chapter: 'Analysis of Sociometric Data', by Charles H. Proctor and Charles P. Loomis."

*An Introduction to Projective Techniques*, edited by Harold H. Anderson and Gladys Anderson, published by Prentice-Hall, Inc., New York, 1951, 720 pp., clothbound. "This contains a chapter 'Psychodrama as a Projective Technique', by Robert B. Haas and J. L. Moreno."

*Social Class in America*, by W. Lloyd Warner, Marchia Meeker, Kenneth Eells, published by Science Research Associates, Inc., Chicago, 1949, 274 pp. clothbound.

*The Psychology of Adolescent Development*, by Raymond G. Kuhlen, published by Harper & Brothers, New York, 1951, 675 pp., clothbound.

*Interaction Process Analysis*, A Method for the Study of Small Groups, by Robert F. Bales, published by Addison-Wesley Press, Inc., Cambridge, Mass., 1950, 203 pp., clothbound.

*The Threshold of the Abnormal*, by Werner Wolff, published by Heritage House, New York, 1950, 473 pp., clothbound.

# WHO SHALL SURVIVE?

A NEW APPROACH TO THE PROBLEM OF HUMAN INTERRELATIONS

J. L. Moreno, M.D.

With a Foreword by William Alauson White, M.D.

Second, Revised and Enlarged Edition in Two Volumes

The first edition of this book appeared in the spring of 1934 as Monograph No. 58 of the "Nervous and Mental Disease Publishing Co., Washington, D.C.

The reprinting of this book is now in the final stages. Because of continuous and growing demand for the book special efforts have been made to extend it so that it can be a useful guide to researchers as well as for clinical workers in the field of human relations. Its most important improvement consists in "*the sociometric geography of human society*," a map of more than 300 charts introduced, analyzed and indexed. All the charts contained in the original edition of this book are reproduced and many new charts are added so as to encompass the various contributions, new applications and discoveries made by sociometrists in the course of twenty years. The sociologist, the social psychologist, the clinical psychologist, the anthropologist, the psychiatrist, the educator, the philosopher and the artist will find here represented in direct and visual manner the hidden resources of the human group. A large number of charts are multicolored sociometric maps of whole communities giving a bird's eye view of their internal growth and structure.

The original text of the book is unabridged, supplementary materials are added to bring the reader up to date with new developments. The book is as vigorous and refreshing today as when it first appeared. Although it became the fountainhead of a new science and methodology in human relations many of its fertile ideas are still buried in the book, in need of rediscovery and further development.

The book and the maps will be published in a single volume, but the book of maps, "Sociometric Geography of Human Society" will be available as a separate volume.

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